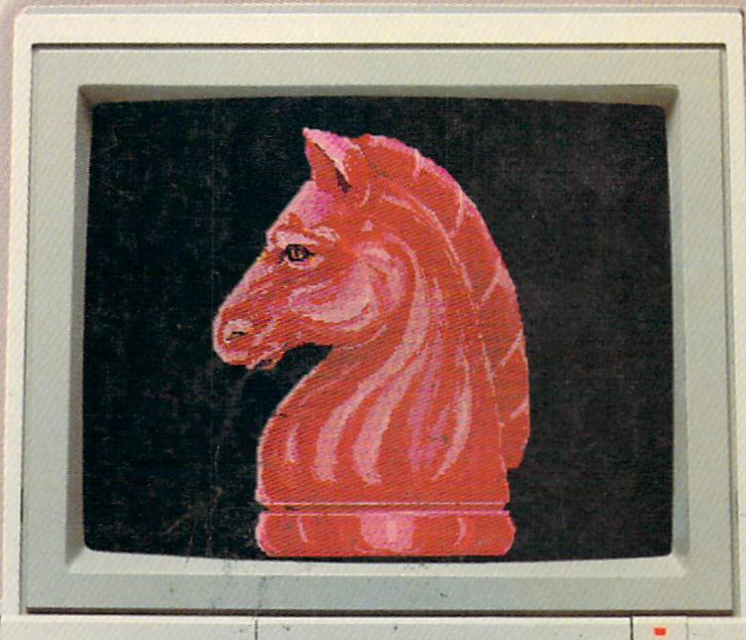
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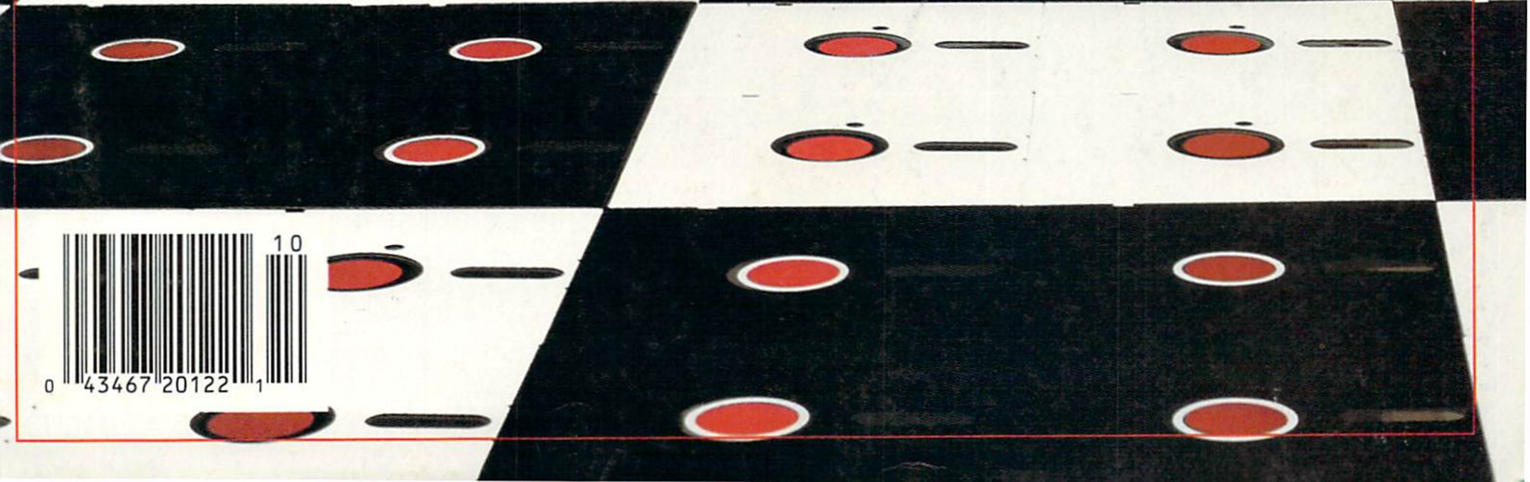
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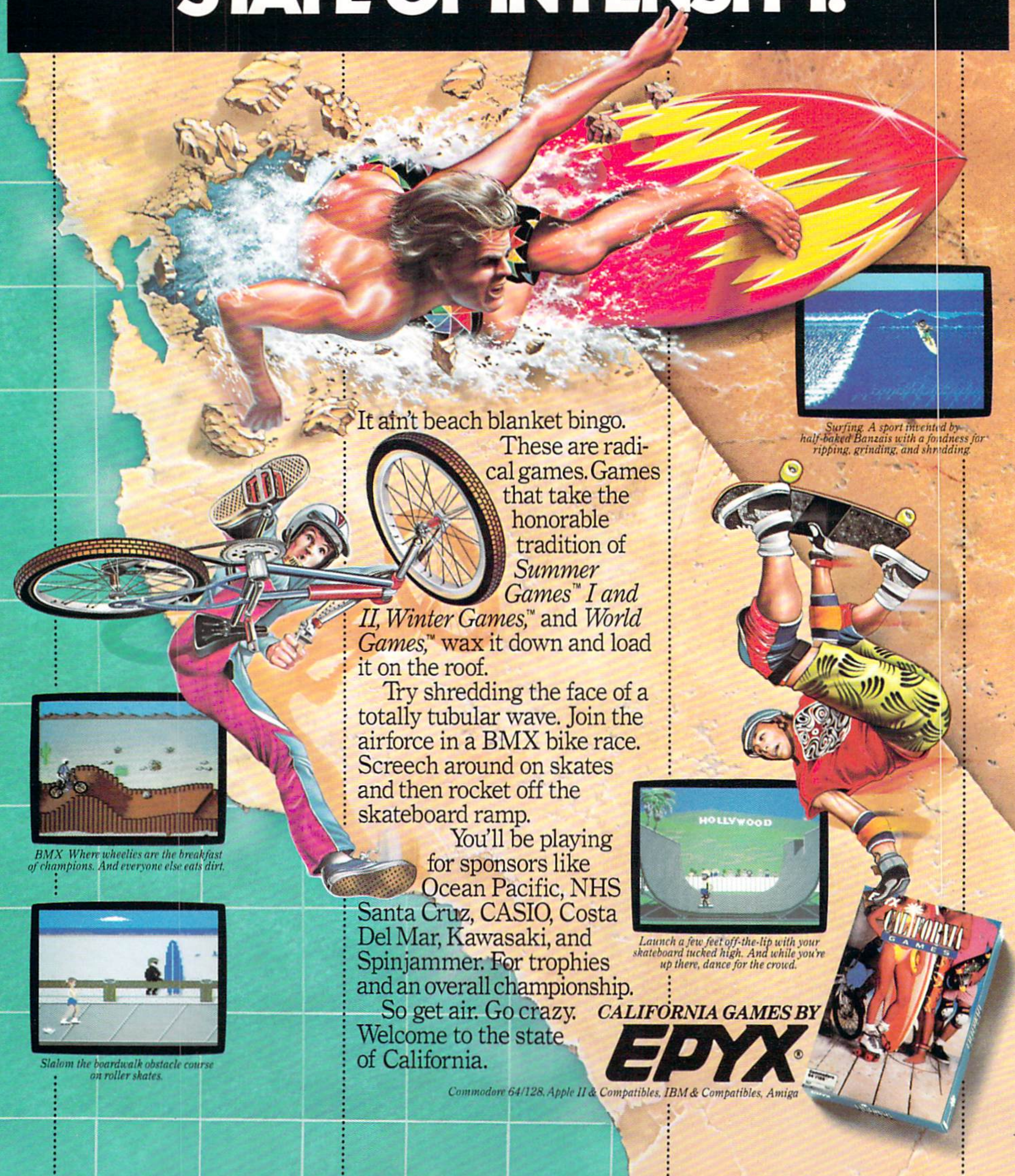
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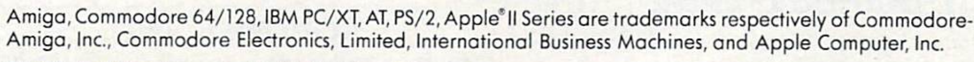
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Commodore
MAGAZINE

OCTOBER 1988, *Volume 9, Number 10*


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FEATURES

COVER STORY

COVER PHOTO: *Gene Smith*
Computer Graphics: *Bob Clark*

REVIEWS

DEPARTMENTS



To the Editor:

I read with interest and annoyance [Electronic Arts'] response to Frank Cox's letter in the July issue. Interest because I think many of us enjoy learning about how decisions are made in the software design such as the conversion of *Chuck Yeager's Advanced Flight Trainer (AFT)*. Annoyance because of the myopic view of the marketplace. Why does Commodore bother creating RAM expansion units and other such enhancements and then encourage lowest common denominator software development?

While the reason cited for not including these features was the limited available RAM, the Commodore 64 can load 256K RAM in the expansion unit (the size of the IBM code), the Commodore 128 has half that to start with and access to 512K more! But *AFT* ignores admittedly important functions rather than offer them as options available to 128 and/or RAM expansion-equipped users. I'm sure such a design would add to the attractiveness of the package, increase sales and give non-RAM expansion users a reason to buy one. Why not just offer the software in a form that us upgrading Commodore diehards can appreciate?

Sincerely,
John C. Powers
Ewing, NJ

Commodore Responds: *Commodore agrees with your perception that more should be done to allow users to utilize upgraded Commodore products. An example of our commitment to this goal is the recent release of a Commodore 64/128 Developer's Package. This new product includes two diskettes and a manual. The package includes an editor, assembler, 128 tools, 1571/1581 burst routines and 64 fast loaders. It is available for $50 directly from Commodore by writing to CATS (Commodore/Amiga Technical Support), 1200 Wilson Drive, West Chester, PA 19380.*

Commodore believes that it best supports the user by concentrating on hardware and peripheral technologies. We encourage the third party software companies to address the software needs of the marketplace. Consumers can help by writing the presidents of software companies when their products do not meet your desires.

John Campbell
Manager,
Worldwide Software and Product Support
Commodore International Ltd.

To the Editor:

I feel that I speak for many 64 owners who are in a pretty tight spot right now because of Berkeley's new *geoPublish* program. I, like most of the other owners I know, have a 1541 drive, color printer, mouse and monitor. As you probably know, *geoPublish* is a very demanding program as far as memory goes on the 64, I am thinking of buying another disk drive so that I can have *geoPublish* and the necessary programs on one disk and use the other drive for nothing but documents.

I was thinking of buying the 1581 3.5-inch drive because of the massive storage ability (over 800K, 1541 only 170K) and, from what I hear, the much faster data handling. Will I be able to use my 1541 with the 1581 or should I just get another old 1541? Please correct me if my figures are incorrect.

Obviously what I will have to do is boot up with the original 5.25-inch disk on the 1541 and then use the 3.5-inch disk on the 1581 for either the documents, the utility programs, or both. What do you think I should do?

Sincerely,
Mark Miller
Lexington, KY

Berkeley's Response: *The question you posed has been asked at a very opportune time. Berkeley Softworks is in the process of releasing GEOS 2.0, which does support the 1581 disk drive. The extra memory of the 1581, when combined with GEOS 2.0, makes working with* geoPublish *both faster and easier. Our recommendation would be to purchase a 1581 instead of a 1541 and also GEOS 2.0 (which you will be offered at a reduced price if you are a registered GEOS owner).*

Another alternative is to purchase a 1764 RAM expansion unit. The advantage is its increased speed, even over the 1581. However, the 1764 does not have 800K of storage capacity as does the 1581. Your decision as to which peripheral to purchase should be based on whether you would like greatly increased speed (the 1764), or slightly increased speed and more storage capacity per disk (the 1581).

Leland J. Llevano
Vice President, Marketing
Berkeley Softworks

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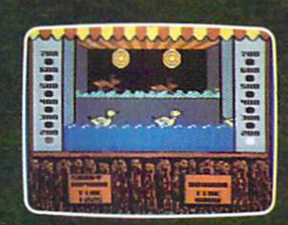
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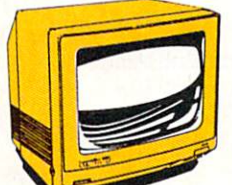


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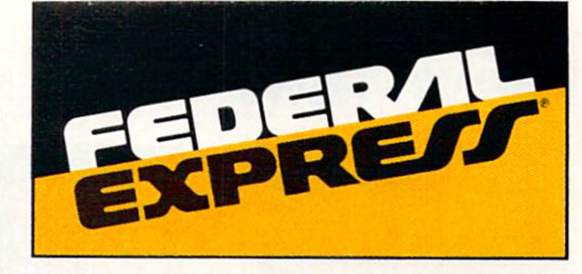
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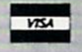
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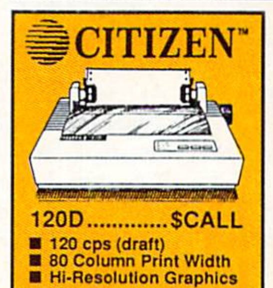
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October has been designated the second annual **Computer Learning Month,** an official project of the Software Publishers Association. "CLM 1987 was the first time that competitors in the computer, software and publishing industries worked together to launch a major public education program to promote awareness of the benefits of technology," according to SPA Director Ken Walsh.

This year's theme is: "Take Part in Computer Learning Month. You'll Love the Relationships that Develop." The theme emphasizes that computer learning is not an isolated activity, but a means of encouraging interpersonal relationships.

"In 1987, CLM concentrated on the K-12 area. Plans for 1988 specifically address the needs of more people," said Sally Bowman, Director of CLM. "We are making a concerted effort to expand CLM's focus into the university, home and consumer areas, and we are more actively involving community groups, schools, state education departments, national organizations and retailers." In addition to the principal sponsors listed, **Computer Learning Month** is supported by 39 State Departments of Education.

Commodore Business Machines' sponsorship of **Computer Learning Month** includes a special offer for educators. During October any educator who purchases an Amiga 500 System will receive $1000 worth of free software. Contact your local Commodore Education Dealer for details. For the name of a participating Commodore Education Dealer near you, call (800) 343-3000.

Computer Learning Month's public service/public education campaign is supported by a variety of materials for schools, universities and community groups. Included are posters, lesson plan books for grades K-12 and a university software resource guide. For families, CLM offers a family activities guide and **Everything You Need to Know (But Were Afraid to Ask Your Kids) About Computer Learning,** designed to help parents learn about computers as educational tools. CLM will also publish **Preparing for a Career in the 21st Century,** directed at adults and prospective high school and college graduates. The book focuses on ways computers are used in different vocations.

Computer Learning Month is also sponsoring a number of contests for schools, universities, user groups, community groups, teachers and individuals. For more information write to: Computer Learning Month, P.O. Box 60967, Palo Alto, CA 94306-0967.

GOMF 3.0

Hypertek/Silicon Springs has released **GOMF 3.0—The GOMF Button** (hardware/software) and **GOMF 3.0** (software) for the Amiga. An update of the previously released shareware program, **GOMF 3.0** lets the user recover data after a system GURU message. The **GOMF 3.0 Button** is a 1″×2″ circuit board that is installed under the Paula chip. A small wire with a push-button protrudes out of the case; with a push of the button, locked-up machines unlock. **GOMF 3.0 Button** sells for $69.95; **GOMF 3.0** for $34.95. Registered owners of previous versions can get the **GOMF 3.0 Button** for $30; the software upgrade is $10. For further information contact: Hypertek/Silicon Springs, 205-2571 Shaugnessy St., Port Coquitlam, B.C., Canada V3C 3G3. Phone: (604) 942-4577.

Karnov

Data East has released a Commodore 64 version of the coin-op action adventure **Karnov.** The player takes on the title role as a Russian in search of the Lost Treasure of Babylon. **Karnov** has three lives in his battles against enemies on nine levels. **Karnov** has a suggested retail price of $29.95. For more information contact: Data East USA, Inc., 470 Needles Drive, San Jose, CA 95112. Or call: (408) 286-7074.

Commodore Bundles GEOS with 1541's

Commodore International, Ltd. and Berkeley Softworks have announced an agreement to bundle a free copy of GEOS deskTop version 1.5 with Commodore's 1541 disk drive through Commodore's worldwide distribution channels. The bundling of the new GEOS deskTop (which includes the GEOS kernal, desk accessories and a variety of fonts) replaces the previous agreement in which GEOS applications were distributed with the Commodore 64. **GeoWrite** and **geoPaint,** previously bundled with Commodore computers, will be sold through retail channels as part of the new GEOS 2.0 package.

Main Frame

MicroIllusions has released **Main Frame** for the Commodore 64. You must stop TriComplex III, a computer trying to annihilate humankind. With the help of a satellite you race against time in an attempt to shut down the fiendish computer's four main power switches. Suggested retail price for **Main Frame** is $39.95. For more details contact: MicroIllusions, 17408 Chatsworth St., Granada Hills, CA 91344. Or call: (800) 522-2041 or (818) 360-3715.

Lifestyle Software

Lifestyle Publishing Group has been established to market "Lifestyle Software"—Commodore 64 programs covering health, cooking, hobbies, dressing tips, etc. Titles include **The Great Chefs of PBS, Vol. 1-3** ($24 per volume), **Golf's Best** ($14.95), **Micro Wine Companion** ($39.95) and **Cooking With Kids** ($14.95). For more information on Lifestyle Software contact: Lifestyle Publishing Group, 45 Cordova St., St. Augustine, FL 32084. Phone: (800) 525-4653.

Dive Bomber

Epyx has announced a new World War II flight/combat simulator for the Commodore 64 and Amiga. Your mission in **Dive Bomber** is to destroy the German battleship Bismarck and fend off the U-boats and enemy support aircraft while mastering real-time controls, machine guns, torpedoes and landing procedures. **Dive Bomber** retails for $39.95 for the Commodore 64 and $49.95 for the Amiga. For more details contact: Epyx, Inc., 600 Galveston Dr., P.O. Box 8020, Redwood City, CA 94063. Or call: (415) 368-3200.

L.A. Crackdown

L.A. Crackdown is a new Epyx release in their Masters Collection line for the advanced Commodore 64 game player. The program pits you (as senior detective with the Los Angeles Police Department) against an urban drug kingpin. You'll select a fresh recruit from the Police Academy to assist with the surveillance. You guide the rookie as he questions suspects, gathers clues, installs bugs, makes arrests, photographs evidence and plans a stakeout. Suggested retail price of **L.A. Crackdown** is $39.95. For further information contact: Epyx, Inc., 600 Galveston Dr., P.O. Box 8020, Redwood City, CA 94063. Phone: (415) 368-3200.

Banner Band

Micro Format has released two new products in its Banner Band line for Commodore banner makers. **Christmas Banner Band** and **Party Banner Band** are 45' continuous paper products with no cross perforations for printing banners, signs and spreadsheets. In addition to holiday and party designs, Banner Band comes in white, yellow, pink, blue, green and goldenrod. For details contact: Micro Format, 533 N. Wolf Rd., Wheeling, IL 60090. Or call: (312) 520-4699.

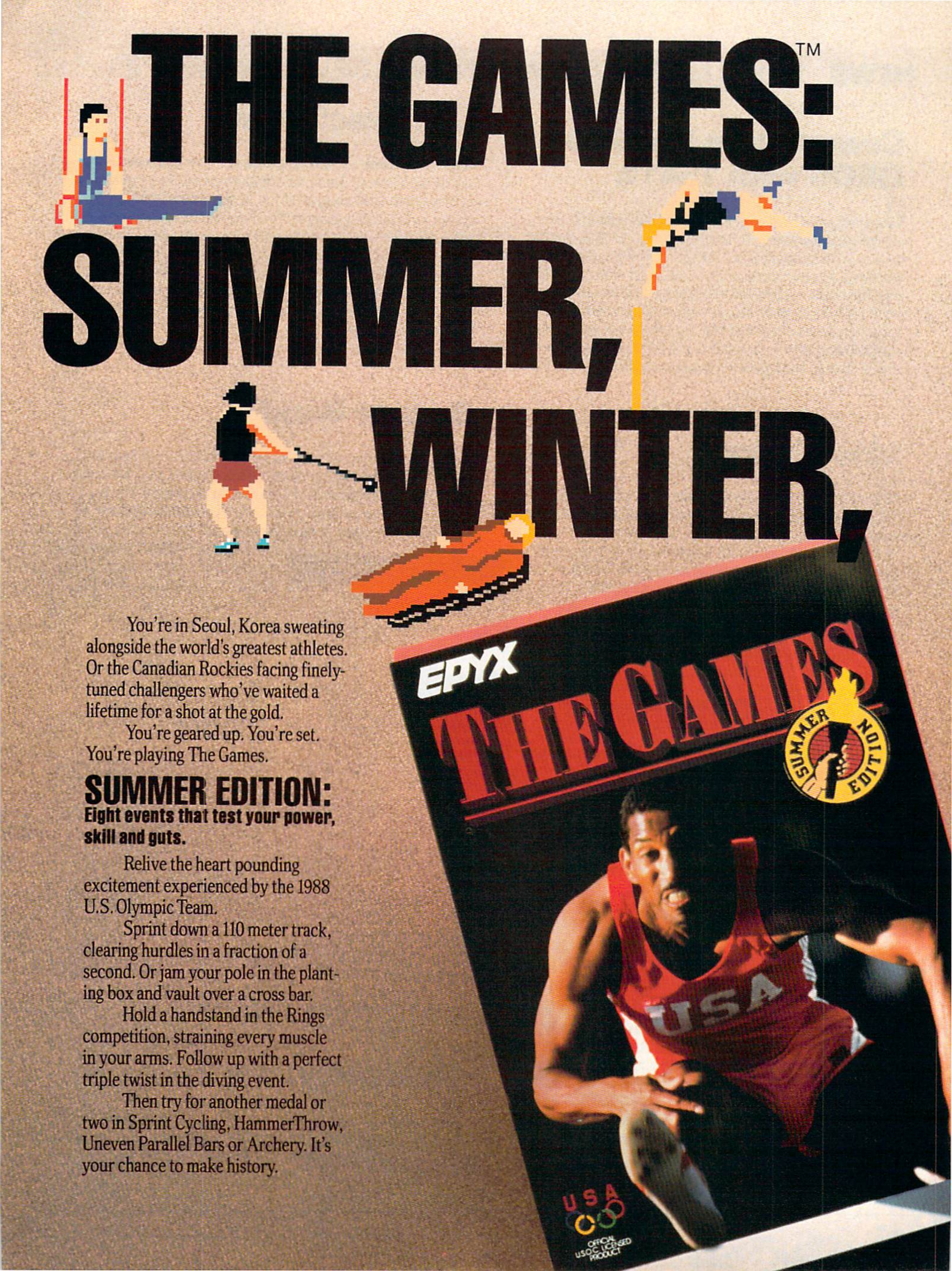


Cosmic Relief

Electronic Arts will be distributing DataSoft's **Cosmic Relief: Prof. Renegade to the Rescue,** an arcade adventure for the Commodore 64 and Amiga. The program takes players back 40 years to find Professor K.K. Renegade, who predicts that a catastrophic asteroid is heading straight for earth. You select one of five international adventurers to assist you in finding the professor and building an anti-asteroid deflector to prevent the destruction of the earth. The Commodore 64 version has a suggested retail price of $24.95; the Amiga version sells for $34.95. For further details contact: Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. Phone: (415) 571-7171.

Mindscape/SSI Pact

Mindscape, Inc. and Strategic Simulations, Inc. (SSI) have announced an agreement to publish SSI strategy/simulation classics



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under Mindscape's reduced-price Thunder Mountain line. The first titles to be released under this agreement are **Fortress, Battalion Commander, Nam** and **Geopolitique 1990.** Mindscape president and CEO Roger Buoy commented, "The SSI list gives enthusiasts an impressive selection of programs for under ten dollars." For further details contact: Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062. Phone: (312) 480-7667.

Wizardry II

Wizardry II: The Knight of Diamonds is Sir-Tech's latest role-playing release for the Commodore 64. Characters developed in **Wizardry I: The Mad Overlord** are used in the sequel to battle over 100 monsters in the six-level 3D maze. **Wizardry II** retails for $39.95. Details are available from: Sir-Tech Software, Inc., P.O. Box 245, Charlestown Mall, Ogdensburg, NY 13669. Phone: (315) 393-6633.

Monopoly

Boardwalk and Park Place are up for grabs in the new Electronic Arts Commodore 64 release **Monopoly.** Computerized features make the classic Atlantic City real estate game easier to play, and the player can now play against the computer, human opponents or a combination of both. Up to eight players can win or lose a fortune in this perennial favorite. **Monopoly** carries a suggested retail price of $29.95. For details contact: Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. Phone: (415) 571-7171.

Bard's Tale II: Destiny Knight

Bard's Tale II: Destiny Knight has been released for the Amiga by Electronic Arts. The fantasy sequel to **The Bard's Tale** includes an expanded dominion and advanced combat and magic systems. Six complete cities and 25 dungeon levels complicate your quest to recover the seven broken pieces of the Destiny Wand and restore peace and prosperity to the Realm. **Bard's Tale II: Destiny Knight** for the Amiga has a suggested retail price of $59.95. A Cluebook can also be purchased for $12.95. For more information contact: Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. Phone: (415) 571-7171.

DeluxePhotoLab

Electronic Arts has released **DeluxePhotoLab,** an Amiga paint and print program that provides artists with more colors, larger canvases and greater graphic flexibility. **DeluxePhotoLab,** designed by Digital Creations, allows users to create and manipulate photographic-quality images in eight levels of resolution in any Amiga graphics mode (including hold and modify and Extra-Halfbrite). Images can be printed in any size from 1″ × 1″ up to 10′ × 10′. **DeluxePhotoLab** retails for $149.99. For further information contact: Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. Or call: (415) 571-7171.

X-Specs

Haitex Resources, Inc. has introduced **X-Specs** 3D glasses for the Amiga. The stereoscopic 3D accessory plugs into the joystick port and has a wide range of applications. **X-Specs** is packaged with **SpaceSpuds**, a 3D action arcade game in outer space. Other entertainment programs are under development to take advantage of **X-Specs'** unique capabilities.

But **X-Specs** are not all fun and games. UCLA Medical Labs doctors are employing **X-Specs** for magnetic resonance brain scan imaging while the chemistry department of the University of Cincinnati and Scripps Labs (CA) are using **X-Specs** for molecular modeling. Amiga applications in optometry, architectural design, art and space flight are also being explored.

A Commodore 64 version of the product is also under development. The Amiga version of **X-Specs** includes one pair of glasses, an interface that supports up to two pairs of glasses, a disk of 3D images and **SpaceSpuds. X-Specs** retails for $124.95. For more information contact: Haitex Resources, 208 Carrollton Park, Suite 1207, Carrollton, TX 75006. Or call: (214) 241-8030.

City Desk 2.0

MicroSearch has released an update of their popular desktop publishing program for the Amiga. **City Desk 2.0** includes text flow around irregular graphics, auto hyphenation, PostScript and HP Series II font support and new gray scale support with four shades on screen and up to 16 on the printout. **City Desk 2.0** retails for $199.95. Registered **City Desk 1.0** users can upgrade for $35.00. For further details contact: MicroSearch, Inc., 9896 Southwest Freeway, Houston, TX 77074. Phone: (713) 988-2818.

flickerFixer FCC Approved

MicroWay's graphics adaptor for the Amiga 2000, **flickerFixer,** has received Class B certification by the FCC. **FlickerFixer** eliminates interlace flicker and visible scan lines on the Amiga 2000 display. In addition, **flickerFixer** is now compatible with PAL versions of the Amiga 2000 sold in Europe. **FlickerFixer** retails for $595. For more information contact: MicroWay, P.O. Box 79, Kingston, MA 02364. Or call: (617) 934-2414.

Infocom Unveils Graphic Adventures

by Russ Ceccola

On July 19, Infocom of Cambridge, MA, hosted a press conference at which they introduced four new titles to be released in the latter part of 1988 and the first quarter of 1989. The four games are: **Zork Zero: The Revenge of Megaboz, Shogun, Journey** and **BattleTech: The Crescent Hawk's Inception.** All include graphics of some form, each in an entirely different way. From the looks of things, Infocom has maintained their place at the head of interactive fiction software and quite possibly will soon rule the computer adventure genre. Under the direction of Mediagenic (who bought Infocom in 1986), Infocom has made a good attempt at proving their leadership with the four newest adventures. All appear to be fun and easy to play with impressive graphics adding an extra dimension to the prose and puzzles all Infocom fans have come to know and love.



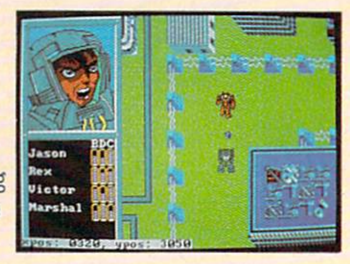
Zork Zero is a Steve Meretzky game with all the humor and wonderful innuendos you would expect from the popular Infocom author. The game takes you back to the beginning of the Great Underground Empire and allows you to witness the fall of the Empire and Lord Dimwit Flathead, see the origins of the White House in **Zork I** and grues and discover the secrets of the Empire over a time span of a century. **Zork Zero** features on-screen mapping, with graphic icons given to each location, over 200 locations and 13 maps, graphically decorated borders that reflect the current location and hints. You can also play Double Fanucci and other games that are relevant to the game's story for the first time. Meretzky stated that he wanted to "use graphics differently—integrating graphics into puzzles and not just using them as surface gloss." **Zork Zero** will be available for the Amiga early next year and for the Commodore 128 next spring. Suggested retail price for both versions is $49.95.



Shogun, designed by Infocom veteran Dave Lebling, only uses graphics to show current locations or characters with whom you are talking. Unlike the other titles, **Shogun**'s graphics are not animated. **Shogun** places you in the role of John Blackthorne, the main character of James Clavell's novel of the same name. Your goal is to adapt to the culture, all the time acting in character and with honor. **Shogun** takes more brain power than the other titles, for there are no challenging puzzles, but rather situations in which you must act as Blackthorne would. As a result, **Shogun** is a highly complex game in which the puzzles revolve around being human and exploring the Japanese culture, carefully making important decisions. **Shogun** boasts an advanced English-language parser which accepts fairly complex sentences and various dialogue. The Amiga version of **Shogun** will be released early in 1989; the Commodore 128 version is scheduled for a spring release. Both versions are priced at $49.95.



Journey is the first of Infocom's new product line—Role-Play Chronicles. In this series, you see the game unravel as a diary, told from the perspective of a narrator who relates the events of the story to you. **Journey** puts you in control of a party of characters trying to save a dying town by destroying the evil Dread Lord and finding the wise wizard Astrix. Each character may be controlled individually, and the adventure may be switched from character to character. You don't need to type commands, as opposed to **Shogun** and **Zork Zero,** for all possible commands at a certain point in a game are divided according to the character for whom they are available on a special status line/menu at the bottom of the screen. There are many spells, hints in the form of past reflection in the narrator's diary called "musings," animated graphics, multiple solutions to puzzles and hundreds of decisions to be made. In **Journey** every decision you make advances the story from the smallest task to the most important choices. This is so that you "get the maximum story with the minimum frustration," according to designer Marc Blank. **Journey** pioneers new directions for role-playing games and brings together everything that well-rounded adventurers want. **Journey** on the Amiga will be available early next year; the Commodore 128 version will be released in the spring. **Journey** retails for $49.95.



Finally, **BattleTech** was introduced to an already-drooling audience. Produced by Christopher Erhardt of Westwood Associates, **BattleTech** is touted as being the largest role-playing game ever, with over four million locations and many puzzles, decisions, characters and battles. **BattleTech** is primarily a graphics game, with menus used to control the BattleMechs (30-foot robots) that you use in your quest to save your home planet from the Kurita warriors. Features include the ability to let the computer fight the battles and suggest a path to follow through the geography, easy-to-learn game menus with which you control all action in **BattleTech,** multiple combat modes, a visual record of how each tank is doing (bar graphs) and beautiful graphics of your surroundings. In addition to these, **BattleTech** also shows from time to time in an upper window "emotive responses," animated close-up graphics of characters reacting to situations, and battles from the point of view of the battlefield. **BattleTech** is not a typical role-playing game in that the battles and game play advance your story. Look forward to Infocom's excellent first attempt at a true role-playing/strategy game. **BattleTech** will be released for the Commodore 64 at a price of $39.95.

After introducing the games to anxious reviewers and members of the press, Infocom treated the guests to a long-running interactive play called **Tamara.** In **Tamara** you physically follow a character that you select at the beginning of the play around the house in which the play takes place, frequently running into other groups of people as their character meets yours. **Tamara** topped an evening of revelation from Infocom and satisfied my hunger for a good adventure after witnessing firsthand what may be the best adventures of the coming year. C

ONE MISTAKE AND IT'S THE BIG PANCAKE.

You're at the foot of one of the world's highest mountains. And you're not snapping pictures. Because this is the FINAL ASSAULT. The only mountain climbing game in the Alps or anywhere else.

IF YOU'RE AFRAID OF HEIGHTS, FORGET IT.

You'll experience the terror and elation of one of the most grueling sports ever. And you'll be tested every step of the way.

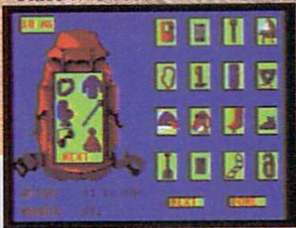




Commodore 64/128, Amiga, Apple IIGS, Atari ST, IBM & compatibles. Screens from Atari ST.

Did you pick the right course? (There are six treacherous possibilities.)

What about supplies? If you run out of soup, you'll be stuck with snow sandwiches.



Forget your spikes or ice picks? You could end up a permanent part of the scenery.



If you have nerves of steel, even when you're dangling 40 feet off a cliff, you might just be one of the lucky few to plant your flag at the peak.

To make the stakes even higher, play with an EPYX high performance joystick.





Compiled by Louis F. Sander

This month's column is heavy into sprites, with a secondary emphasis on commercial programs for things other than game-playing. But as always, there's a wide range of tips on other subjects. Send your own tips, one per sheet of paper, to:

Louis F. Sander
P.O. Box 101011
Pittsburgh, PA 15237

If you prefer, you can send them by Q-Link E-Mail to LFS. Successful contributors get at least $10, plus enough international fame to make any mother proud.

By the way, we're working on a book. It will contain hundreds of Tips & Tricks, *including those ever-popular items from the* Gold Mine. *Watch this space for further news!*

Sprite-making graph paper: Designing sprite images is easier if you begin by sketching your ideas on graph paper. The accompanying program prints a numbered grid of 21 × 24 square blocks, just like those found in the 64 User's Manual.

Joseph R. Charnetski
Plains, PA

```
100 PRINT"[CLEAR,RVS]SPRITE-MAKING
    GRAPH PAPER - J.CHARNETSKI"
110 PRINT"[DOWN2] PRESS 'P' TO PRINT
    A GRAPH, OR"
120 PRINT"[DOWN] PRESS 'Q' TO QUIT...
    [DOWN]"
130 GET A$
140 IF A$="Q" THEN END
150 IF A$<>"P" THEN 130
160 A$=CHR$(15):B$=CHR$(8):OPEN 4,4
    :CMD 4
170 FOR J=1 TO 3:PRINT"1";SPC(7);:NEXT
    :PRINT
180 FOR J=1 TO 3:PRINT"2631";SPC(4)
    :NEXT:PRINT
190 FOR J=1 TO 3:PRINT"84268421";:NEXT
    :PRINT
200 FOR R=1 TO 21:FOR C=1 TO 24
    :PRINT CHR$(111);:NEXT
210 PRINT CHR$(165);MID$(STR$(R),2);B$
    :PRINT A$;:NEXT
220 FOR J=1 TO 24:PRINT CHR$(163);
    :NEXT
230 PRINT#4:CLOSE 4
```

Paratrooper! This program uses two sprites which appear on the screen as a paratrooper and his parachute. Not only is it fun to watch, but it illustrates the methods of defining, displaying and moving sprites on the 64.

If you have a 128, you can use the program in 64 mode or convert it to work in 128 mode as described in the next item of this month's column.

This brief analysis will help you understand just how the program works:

Line 10 and lines 100-130 establish the text display on the screen. Notice how the landing platform at the bottom is composed of graphics available from the keyboard.

Line 140 establishes the initial position, color and size of the two sprites. Line 150 POKEs the sprites into memory, using data from lines 61-76. Line 160 "enables" the sprites, allowing them to be seen when they are positioned on the visible part of the screen.

Lines 170-220 control the paratrooper's motion from top to bottom of the screen.

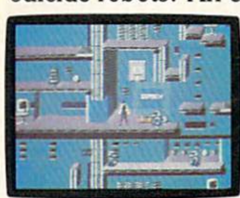
Russell Glenn Heifner
Denver, CO

```
10 PRINT"[CLEAR,RVS,SPACE2]
   PARATROOPER - RUSSELL GLENN
   HEIFNER[SPACE3]"
61 DATA 000,129,000,001,129,128,003,
   060
62 DATA 192,006,086,096,006,187,096,
   006
63 DATA 070,096,006,060,096,003,153,
   192
64 DATA 001,195,128,000,219,000,000,
   219
65 DATA 000,000,090,000,000,024,000,
   000
66 DATA 195,000,001,255,128,001,195,
   128
67 DATA 003,129,192,003,129,192,001,
   129
68 DATA 128,001,195,128,007,195,224,
   000
69 DATA 000,000,000,000,000,000,000,
   000
70 DATA 000,000,000,000,000,000,000,
   000
```

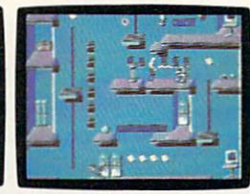
Continued on page 125

IF THIS IS THE FUTURE, THEN YOU'RE HISTORY.

Hold it. What's this? Human-seeking suicide robots? An evil mastermind bent on world annihilation?



There are 8 office towers to search, each with its own theme and level of difficulty.



Of course, Elvin's floor plans are almost as complicated as his global plans.

No wonder they call this mission impossible. Why, it's got even more strategy and action than the original top-selling Impossible Mission.™

The trick here is to collect the secret code numbers that will ultimately allow you to access Elvin's stronghold. And waste him before he wastes the world.

There are over 50 rooms to search for codes. Careful. The floors and catwalks in this place end a little abruptly. And of course, they're guarded by those pesky bots. But you've got an MIA9366B pocket computer to help you crack the security code. A working tape player to play music clues. And a map to show which towers you have or have not searched.

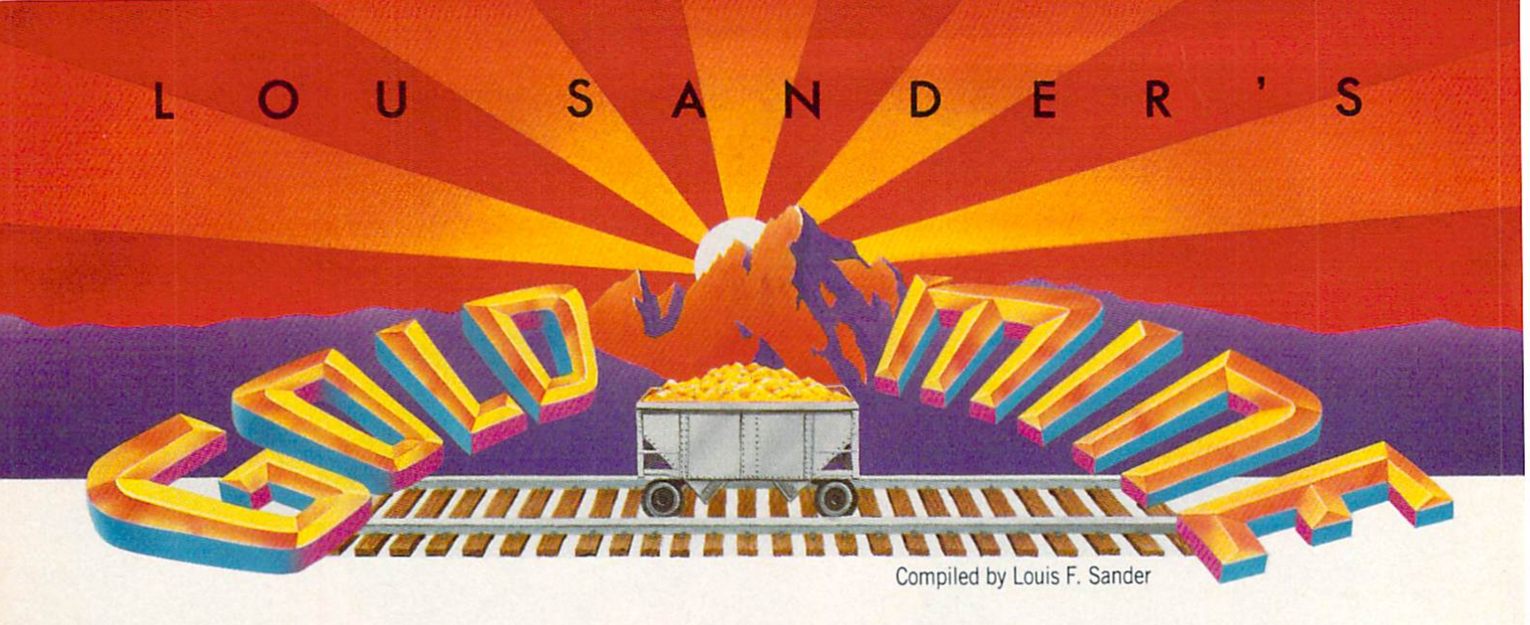
Go then. Elvin is preparing to launch his missile attack in less than ten hours. You must stop him. Or the world will be terminally late for dinner tonight.

IMPOSSIBLE MISSION II



BY EPYX®

Commodore 64, IBM & compatibles, Atari ST, Apple II & compatibles, Amiga



Compiled by Louis F. Sander

Remember, since we can't test every tip, there may be some fool's gold among these nuggets. Also remember that many of them will work on Amiga, Atari, Apple or IBM versions (as well as Commodore 64/128 versions) of the software. Send your own Gold Mine submissions to:

The Gold Mine
P.O. Box 101011
Pittsburgh, PA 15237

Please use a separate sheet for each game, and combine all tips for one game on one sheet. Gold Mine Rules!

ACE: When you are out of gas or about to crash, get over the Allied territory and eject. You will be at a base with gas and weapons restored.
Mike Hartke
Tinley Park, IL

Airborne Ranger: If a minefield or a barbed-wire fence is in your way, you can use a grenade to remove part of it.

If you want to divert attention elsewhere, set a time bomb for 15 seconds (so you have enough time to run away). Switch your weapon to knife, so they can't hear you kill an enemy trooper.
Michael Baumgart
Sparks, NV

Airborne Ranger: Grenades will destroy the weaker bunkers, and they will kill men in a wide range around them. You can also use them to crack iced-over ponds; if the enemy steps on one, he drowns. (So can you!)

Use knives on missions where you don't want to alert other men. For example, in the mission where you are to disable the Jet, the Jet will leave unless you use your knife.
Doug Cross
Sellersburg, IN

Ali Baba and the Forty Thieves: You can only select attack and defend in the first half of your move. To keep from getting lost, draw maps and write down the runes as you go along. Speckled walls can be destroyed by attacking them. Drinking from the magic pool will increase your strength and endurance.
Steven Gabaris
Flushing, NY

Aliens: It's important and practical to make a map of certain places like the APC Rescue, the Air Conduit Maze and the Rescue of Newt. With the map, it will be easier for you to locate your position in the maze.
Ricky Yu
San Jose, Costa Rica

Alternate Reality: The Dungeon: Go to the Shrine of Monsters at 44N, 47E on the first level. Open the enchanted door and defeat the Valkyrie. Move forward one space and receive the Winged Sandals. When you use them, you'll notice that your skill has increased by 50 points.

Now go to the Dwarven Smithy on the second level. Offer the Winged Sandals for sale, and he will say "I'm not interested." When you leave the Smithy, notice that your skill remains the same, even though you aren't wearing the sandals. Put them on and your skill goes up another 50. Repeat the process until your skill is up to the maximum 255, and you'll literally fly through the Dungeon.
Jeff Towich
Whitehall, PA

Apollo 18: On the mission control screen, it's easier to stabilize the gyros by shaking the joystick left and right very quickly.
Jorne Lee and Chris Armstrong
Powell River, British Columbia
Canada

Back to the Future: To win the game, get George and Lorraine still in the right side of the hall with the guitar, then get Biff, with coffee, to stand a little bit in from the right side of the door. George and Lorraine will soon start moving around again.

Keep giving Biff coffee while the two love birds move around. Give your picture back once it is all filled in, then go in and out Doc's door and you'll see something spectacular!
Jasen and Brennan Soutar
Address Unknown

Benji's Space Rescue: In the beginning of the game, don't take so much fuel that it is out of stock. Also remember that there are supplies on planets other than earth.
David Ross
Wheeling, IL

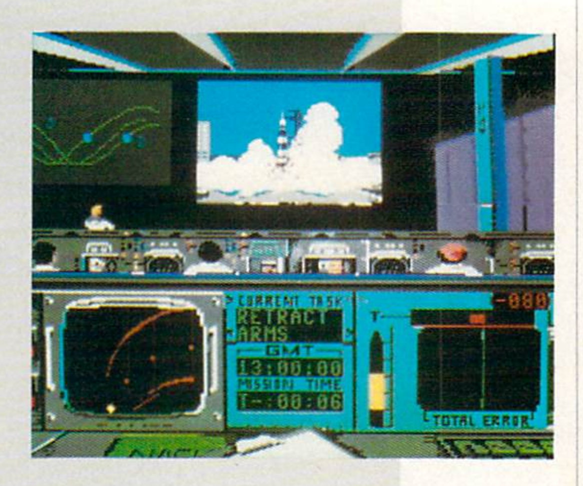
Continued on page 102

Reviewed by Russ Ceccola

Apollo 18

Computer: Commodore 64
Publisher: Accolade
550 S. Winchester Blvd.
Suite 200
San Jose, CA 95128
Medium: Disk
Price: $29.95

Apollo 18 is truly the first space simulation that is firmly grounded in reality.



Having just read a book about the use of computers in space exploration over the last 30 years, I was truly prepared to evaluate *Apollo 18: Mission to the Moon*. What I found when I loaded the disk was a simulation that mimicked very closely the actual Apollo missions. How can I make such a claim without actually having been on a space mission? The book I read gave a detailed account of the workings of the spacecraft as well as the mission events in their correct sequence. *Apollo 18* brings together excellent graphics, sound, speech synthesis and arcade-style challenges to create an atmosphere that puts you in complete control of a mission to the moon.

When I first saw the game manual for *Apollo 18* and realized that the game covered an entire mission, from blastoff to reentry, I thought that it would takes hours of practice and memorization of commands to really get into playing. This has got to be the worst assumption I've made since I thought that *Ultima* would be just another role-playing game. *Apollo 18* forces you, in an entirely pleasant and educational way, to develop the skills and insight needed to fly the spacecraft on the disk. Its unique game play involves honing timing, reflex and position control abilities and applying them to the goal of the simulation.

How, you may ask, do you do all of that? By simply getting your best joystick ready to tackle the mission events that require precise maneuvering. *Apollo 18* presents you with various perspectives (first person in the command module and at the control room console and third-person views of other scenes) in which you must use the joystick to perform in the mission-crucial events that an astronaut would have to execute with his flight stick. Events include such actions as centering crosshairs, pressing the button at a precise instant of time, guiding a moonwalking astronaut and firing rockets to guide an astronaut in space walk.

These actions are depicted in clear graphics and echo the major movements that the real-life astronauts made on their missions. Including this type of action in the game, rather than complex commands involved in typical flight simulators, was the key to the door of success for *Apollo 18*. Instead of memorization, *Apollo 18* relies heavily on practice and joystick adroitness. Until you learn what not to do by messing up time after time in the various events, *Apollo 18* might seem like a chore. In reality, after discovering how to get the rocket off the ground, the purpose of each of the remaining events presents itself clearly as you face the challenge on the screen.

Enough said about the game play, let's talk about the mission itself. In *Apollo 18* (which, by the way, was never an actual mission—Apollo 17 was the last), you duplicate most of the necessary actions of the other Apollo missions, with the exception of collecting moon rocks. Starting off at Mission Control, you perform seven arcade/action events in the place of their occurrence on a real mission. They are: Mission Control (blastoff and pre-launch), Docking, Course Corrections (more than once), Lunar Landing, EVA (Extra Vehicular Activity) Moon Walk, EVA Space Walk and Re-Entry.

These different parts of the game require maneuvering and controlling different spacecraft gauges and the astronaut. Between mission events, you access what is known as the Telemetry screen, the interface that allows you to see all of the instruments that are activated in flight—by turning them on yourself. This interesting touch to the game requires that you hit the RETURN key to turn on various equipment (the words turn green) and use the cursor keys to move between lines of text that describe spacecraft instruments. Only when you have activated all that is needed does the NO GO change to a GO on the status line at the bottom of the screen.

The Telemetry screen takes no skill at all to set the system to GO—a monkey can hit the RETURN key. The purpose of the screen between events is to familiarize the player with the number of switches and settings that the astronaut might use at various points in a mission. The overall effect is that high degrees of realism, excitement and professional integrity transfer themselves upon the mission, adding that extra something that brings the entire simulation together.

As an example of the accuracy of real-life details in *Apollo 18*, certain Telemetry screens require you to type in a number that represents a program for the flight computer to run to further the mission objectives. On real Apollo spacecraft, computer memory was limited, and astronauts had to call up numbered programs from mass storage units to guide the rocket.

Apollo 18 is easy enough to pick up just by reading the quick game play instructions in the game manual. However, I strongly suggest that for the fullest enjoyment of the game you read the long instructions. Only the long version describes all of the instruments and computer programs that you operate on the Telemetry screens. The manual is flawlessly

written in easy-to-understand astronaut jargon and includes, along with the long instructions, a description of the mission events sequence with approximate times at which the events would take place.

If the game play and presentation of *Apollo 18* aren't enough to quench your thirst, look at the screen and listen to the speaker for more bonuses. Accolade's use of graphics sets them apart from most other standard Commodore graphics; they use the full potential of the computer to visually present the mission to the moon. Accolade claims that a lot of the scenes were drawn from actual photographs taken by astronauts and pulled from NASA files in preparation for the design of the simulation. In any case, *Apollo 18* looks good and certain images look like digitized photographs of familiar astronauts.

The SID chip was also given a good workout in *Apollo 18*. Along with a lot of nice sound effects (explosions, firing rockets and space static), speech was peppered throughout the game, as if the leader at Mission Control were inside your computer. From "Lift-off . . . we have lift-off!" to "Descending to lunar surface . . .," you will never be without guidance from Mission Control except during the two or three minutes during re-entry when electromagnetic interference prevents communication. The intelligent use of speech synthesis in *Apollo 18* adds even more realism to an already heart-racing game.

And don't think that you'll perform the mission and then never play *Apollo 18* again. To ensure that you return to try again, *Apollo 18* provides you with a final mission control success percentage and reports on the seven major parts of the game. These reports rate you according to the success with which you performed the various arcade events in the game and give you a percentage for that report. The final total is an average of the percentages you received from each of the seven reports. Finally, you are compared to a permanent "hall of fame" high score list on the disk that offers the real Apollo astronauts as competition.

After playing *Apollo 18* extensively, I have to ask how such a good selection of game elements could be brought together in one package. From a deceptively simple package that looks like the game is a member of a bargain line of software to a modest price tag, everything appears to be right with this simulation. Contrary to most other cases, the appearances aren't deceiving with *Apollo 18*.

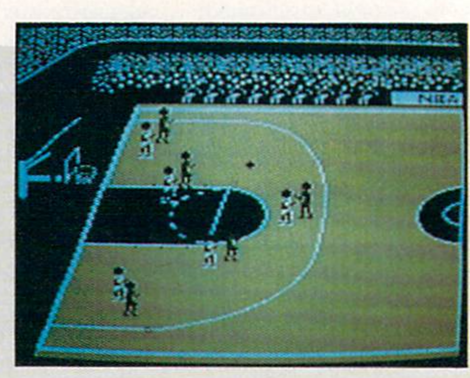
My favorite parts of *Apollo 18* are catching the satellites and moonwalking to the land rover. Practice in these events will have you feeling like a champion. Unfortunately, guiding the command module in re-entry is the toughest maneuver to make in *Apollo 18*, requiring that you keep the module heading toward earth between 5.5 and 7.3 degrees. If you undershoot, the craft burns up in the atmosphere. If you overshoot, you shoot out in space toward the sun. Neither of these outcomes is desirable.

Apollo 18 is truly the first space simulation that is firmly grounded in reality. Not only will you feel as if you have actually been to the moon, but you might also entertain the notion of becoming an astronaut. The amount of preparation that was put into *Apollo 18* is clearly evident from the moment you put the disk into the drive until you see the graphics for your command module landing in the ocean. In any case, I expect that there is something for everybody in this game, whether you're interested in space missions or not. The challenge is of the right difficulty and the presentation is more than fitting for this fictitious Apollo mission. Try *Apollo 18*—you may never want to return from the moon! ■

Reviewed by Mark Cotone

NBA

Computer: Commodore 64
Publisher: Avalon Hill Game Company
4517 Harford Road
Baltimore, Md 21214
Medium: Disk
Price: $39.95



Keep track of all twenty teams if you wish, to see which of the great teams is the greatest over a fantasy season.

Sit back and watch an NBA basketball game, and you'll be witnessing one of the greatest displays of athletic ability in all of professional sports. Cheering spectators are brought to their feet over the unique combination of acrobatic artistry and exhaustive physical combat. There's the quick and accurate pinpoint pass setting up the vicious slam-dunk, a numbing blind-side pick freeing a teammate for a flawless reverse layup, and the aggressive crashing of the boards that initiates the long bomb of a fast break.

So captivating is the exhibition of these hardwood heroes that it's often easy to overlook the most important man on the team, a heart and soul participant who rarely steps out onto the court, but who deservedly claims at least partial credit for every ball that drops through the hoop. He is the coach, the sideline strategist who locks into a 48-minute mental duel with the opposition's brain trust; instructing, maneuvering and cheering his men to try to gain the competitive edge that will hopefully tilt the victory balance in his team's favor.

Thanks to Avalon Hill, this coaching position, the unseen element of basketball, will no longer go unnoticed. With the release of their new *NBA* game for the Commodore 64—a contest that lets one step in and lead some of the greatest teams in the history of the sport—the brains behind the bench will now take a turn at center court.

Who's your favorite? Perhaps it's the Celtics of the '60s, an unyielding team that would forever spoil Boston fans by dominating the league for the better part of the decade. Or maybe it's the steamrolling Knicks of the '70s, the New York dream team of Reed, DeBusschere, Bradley and Walt "Clyde" Frazier, that responds so courageously in a memorable miracle seventh game at the Garden. Or how about those Lakers, with the overpowering skills of a '70s Chamberlain giving way to a different kind of '80s magic with a certain Mr. Johnson. Whatever your taste, Avalon Hill will satisfy with a tempting twenty-team assortment showcasing the best squads and players of the last quarter century; all gathered, suited and anxiously awaiting the instruction and direction of you, their new coach.

[Editor's Note: Avalon Hill has announced that "Season Disks" will also be sold. Currently available are the 1985-86 Season *and* 1986-87 Season. *In addition, they are marketing a* General Manager Disk *which allows you to draft players for team disks and create your own players.]*

NBA gameplay is split into two separate but connected stages: an initial strategy segment, where keyboard coaches select the tactical moves, plays and positions of their team, and a subsequent animation phase, where the results of the chosen offensive and defensive schemes are played out on a colorful simulated court alive with responsive computer hoopsters.

The strategy screen is divided into three sections designed to keep the participants apprised of all the play-making vitals. The upper third displays a continually updated scoreboard, complete with Home and Visiting team point totals, a ticking game clock, and a personal foul and time out tally for each team. In content, it's similar to most arena scoreboards found in the "big" league, providing all the necessary information at a glance.

Beneath this, in the middle section of the screen, is a starting lineup display listing the ten players presently on the court along with a numerical pre-assigned defensive rating for each based upon their tested ability to steal and block. Put out your high-priced superstars or juggle them with some talent off the bench. Either way, get comfortable with your starters and prepare for the jump ball.

The remaining bottom third of the scoreboard area is the most important of all, an unadorned slice of screen where the mental game is fought. Here the coaches square off and try to outthink, outguess and outsmart their rival in an intense chess-like match played with five towering pawns a side.

The offensive play selection is made first. Using a series of option menus, the program helps you to tailor a very specific, personal attack plan. Which point guard will bring the ball up court to orchestrate the team's movement? Will you opt for a couple of short passes to set up an inside shot, or stay wide and rainbow a long-distance bomb to save time and pick up the extra third point? When you're rebounding, will you hit the boards aggressively and put the ball right back up, toss your rebounds back out to a high-percentage shooter, or pull your team out of the paint to guard against a quick reverse attack? Decisions, decisions.

When the offense is set, the defensive coach has a chance to position his men in an attempt to stifle a charge. Will you guard against the outside shot or crowd the lane to wall off any layup attempts? Maybe you should gamble a bit by trying for a steal or pressuring with a double team. And then there's always the excitement of a fast break, which can turn your opponent's missed basket into a quick two points down court.

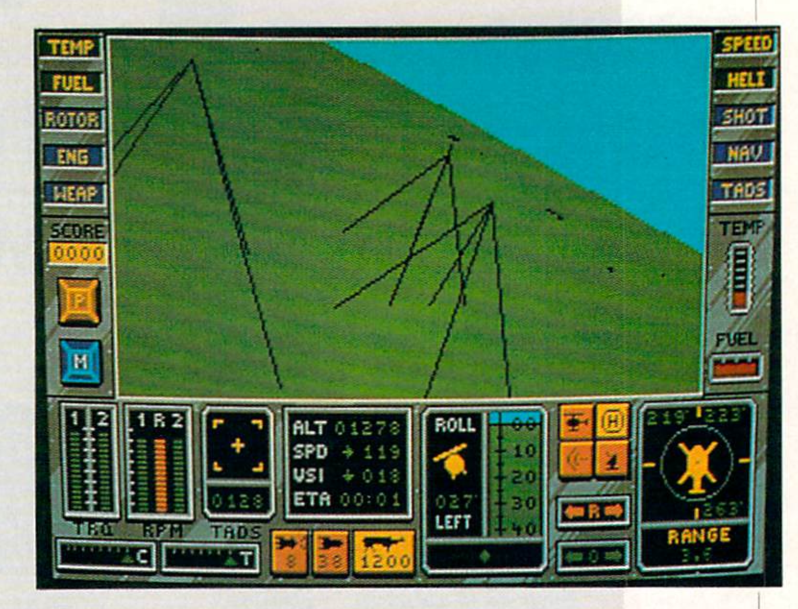
Every aspect of the game is in your hands, a fact that might make actual game play sound fairly complicated. But all the coaching decisions, as complex and as wide ranging as they are, can be implemented fairly easily with a tap of a key or a tug of the joystick. Swift and simple? Yes, yet the real wonder of this game is not how quickly you can input selections, but rather how all of this information is instantly transformed into a statistically

Continued on page 106

Reviewed by Bob Guerra

Tomahawk

Computer: Commodore 64
Publisher: Datasoft
19808 Nordhoff Place
Chatsworth, CA 91311
Medium: Disk
Price: $29.95



Advanced *Tomahawk* pilots may even add cross-winds and turbulence to simulate realistic flying conditions.

Tomahawk is a realistic flight and combat simulator that puts you at the controls of an AH-64A Apache helicopter—the same chopper simulated in MicroProse's outstanding *Gunship* helicopter simulation. While overall *Gunship* is the more complete simulation, *Tomahawk* offers a new set of challenges, and fans of this genre will probably want to own both computerized choppers.

Joystick pilots who sign up for *Tomahawk* duty may select a Training Mission that lets you get a feel for the aircraft without having to worry about enemy ground fire and hostile aircraft, or one of three increasingly difficult combat missions. The main difference between the combat missions is the number of enemy-controlled map sectors you're required to clear. Each is occupied by eight ground targets such as tanks and field guns and is patrolled by enemy helicopters.

No matter which mission you select, you may choose to fly at day or night, in clear or cloudy skies. If you opt for the clouds, the cloud base can be set at 50, 250, 500, 1000 or 5000 feet. Advanced *Tomahawk* pilots may even add cross-winds and turbulence to simulate realistic flying conditions. In addition, each mission may be flown at any of four "Pilot Rating" levels: Trainee Pilot, Squadron Leader, Instructor or Ace. The higher the level, the more accurate your enemy's weapons will be. Finally, though sound can be toggled on and off, if you're like me, you'll appreciate the realistic sounds of the helicopter's spinning rotors as you open up the engine to full and gradually raise the collective until airborne.

One choice that you won't have to make is which armaments to take into battle. Each time you take off, your *Tomahawk* is automatically equipped with eight laser-guided, auto-tracking Hellfire missiles, 38 unguided rockets, and a 30mm chain-gun loaded with 1200 rounds of ammunition. The amount of each type of ammo remaining is graphically displayed on the instrument panel, so you can always tell at a glance when you're running low. While your guided Hellfire missiles have the longest range of any of your weapons (3.1 miles) and can easily destroy any enemy you'll encounter, more points are awarded for taking out the enemy with your shorter range weapons. Although it would have been nice to be able to custom-arm your chopper, a fresh supply of missiles, rockets and rounds for your chain gun can be picked up by landing at any allied base.

To help you locate your targets, a Doppler radar system is built into the cockpit. As you cycle through the available targets, the distance to the target is displayed, along with the target's bearing. Simply match your heading to the target's bearing and be ready to fire when the target is in range. Three other Doppler radar modes are also available to help you find allied landing pads, enemy choppers or any of eight guidance beacons distributed around the map.

Other indicators on the *Tomahawk*'s instrument panel include engine rpm and torque gauges, and a Target Acquisition and Designation System (TADS) that identifies selected targets and displays their range up to 10,000 feet. In addition, a single keystroke replaces the cockpit view with a 128-sector map showing the position of the *Tomahawk* and nearby enemy choppers. Sectors are displayed in blue if controlled by the good guys, red if enemy-controlled, and white if they must still be cleared in order to complete your mission.

Tomahawk comes with a concise 17-page instruction manual which is supplemented by a quick-reference card and a six-page insert detailing the history, design and development of the real AH-64. Although the information contained here is interesting, the insert seems like a last-minute addition included to make the game seem better researched than it really is.

While the descriptions of *Tomahawk*'s three combat scenarios lack some of the historical detail that you might expect from a first-class military simulation, the game does create a sense of realism with good graphic animation and sound effects, working instrumentation, and responsive joystick control. However, if you're shopping for your *first* combat helicopter simulation, there are better choppers available.

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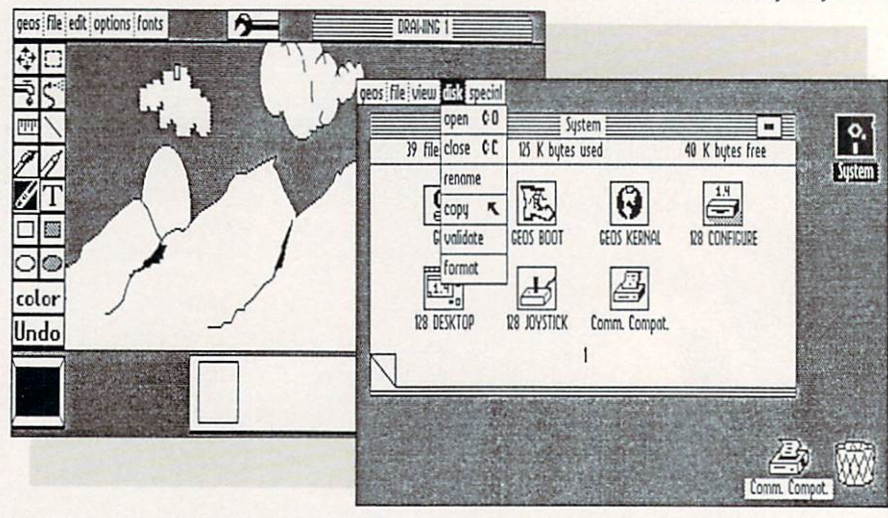
BY EPYX

Commodore 64/128, Apple II & compatibles, IBM & compatibles, Amiga

Reviewed by Gary V. Fields

GEOS 128

Computer: Commodore 128
Publisher: Berkeley Softworks
2150 Shattuck Ave.
Berkeley, CA 94704
Medium: Disk
Price: $69.95



Before 1986, no single software package in history had offered so much potential and power to the end user as GEOS for the Commodore 64 did. Now Berkeley Softworks has done it again. GEOS 128 is the full-grown, icon-driven operating system for the Commodore 128 computer user. Because the 128 is a faster operating computer with more memory and 80-column display capabilities, GEOS 128 can do more than GEOS 64 could ever hope and do it faster. As a result, when the two (the 128 and GEOS 128) are linked, it's hard to imagine a more useful, friendlier system in the price range. Every good thing that has been said about GEOS 64 goes double for GEOS 128.

For those who may not be familiar with Berkeley Softworks' revolutionary software GEOS, the four letters stand for Graphic Environment Operating System. Basically, when this software is installed, your Commodore 128 is driven by a new, friendlier, icon disk operating system. Rather than having to key in commands, like DLOAD, DSAVE and RUN to operate programs, you just point at a graphic symbol (using a joystick or mouse) and click a couple of times. If the symbol (usually called an icon) represents an executable program it will begin. Duplicating disks or copying files from one to another requires no typing or real knowledge of DOS—you simply grab the icon (representing the file you want copied) with the pointer and drag it to another disk. Renaming files or formatting a new disk is all done with pull-down menus.

In short, GEOS 128 was created for those of us who prefer to rely on our intuition (the program's control structure is logical and intuitively designed) rather than memorize instruction manuals. GEOS 128 has all the features which everyone loves about the older 64 version. Everything is icon and pull-down menu driven.

The program includes Commodore 128 versions of both *geoWrite* and *geoPaint*. *GeoWrite* is a flexible word processor which lets you incorporate graphics and different fonts and type styles into your documents. And best of all, the preview screen will show exactly how the document will appear when printed. *GeoPaint* is a powerful graphic design tool which lets you design and print drawings with minutely detailed precision, true round circles and font-perfect text. The major difference between the 64 and 128 versions is the ability to toggle between 40- and 80-column display. If you already own a 40-column display monitor, you don't have to go into debt to upgrade, just to use GEOS 128—it works equally well with either a 40- or 80-column screen. The advantage of using the 80-column display is that more information is displayed, but when the larger screen is used, *geoPaint* does not support color. If you want to color your creations you'll have to switch to the 40-column screen. Personally, (since I no longer own a printer capable of color) I prefer the 80-column monochrome display and the black and white printouts I can design with *geoPaint.*

For many looking for a good graphic editor for their 128, *geoPaint* alone will be reason enough to purchase GEOS 128. This program looks and performs like the much acclaimed (and checkbook choking) *MacPaint* for the Macintosh. Because of the 128's extra memory and ability to operate with the fat and fast 1571 and 1581 drives, *geoPaint 128* runs much faster and smoother than *geoPaint 64*. If you want even more speed from GEOS 128, you can get instant response by investing in the 1750 RAM expansion unit which brings the 128's memory up to a very healthy 512K. I've used many of the graphic programs available for more expensive 16- and 32-bit systems, and I'm still impressed with the power and speed of *geoPaint* and my 1571 drive. The program has almost everything I look for in a graphic tool including a measuring gauge which displays either inches or pixels, true round circles, rectangles, text, sprays, fills, textures, brushes, magnification, mirror, copy, etc. The more I use *geoPaint,* the more I like it.

Along with *geoPaint* and *geoWrite,* the program disk comes with a mini word processor called *Notepad* which is just that—a quick way to type and save notes to yourself (notes can later be printed or inserted into *geoWrite* documents). There is also a pop-up calculator which you can activate at any time to help you with math problems, and a there's a clock which will prevent you from missing important appointments.

Perhaps the nicest thing about GEOS 128 is the ability to organize your desktop to suit your own needs. If you want a clock on the desk, fine. If you want to create a disk just for designing graphics, that's easily done too. And because new drivers for input devices (light pen, mouse) and printers, as well as unique utilities (for converting graphic formats, text files, etc.) are being released almost daily into public domain, the GEOS 128 package you use today will expand and get better with age.

Years ago I decided I was never going to like a mouse as an input device. I was foolish. Although GEOS 128 will work with several different input devices including light pens and joysticks as well as direct keyboard commands, I've learned to love the 1351 mouse. GEOS 128 and the mouse complement each other. The mouse makes jumping from one area to another quick and when using *geoPaint* gives me more accurate control of where pixels are turned on and off. So my advice is to at

least try the mouse if you are using GEOS 128—it gives a professional program the final touch which says this is a serious business machine not a game box.

If you already own other GEOS 64 programs, like *geoPublish, Personal Newsletter,* or others, you'll be happy to know they will work with the 128 version of GEOS just as well. You won't be able to use the 128's 80-column display with them (those programs were designed for 40 columns only), but other than that, you'll notice no difference. As a 64 owner who has upgraded to a 128 and already owns GEOS 64 and several GEOS-compatible programs, I found this to be good news. If you do not own GEOS 64 and decide to expand your software library, look to the new GEOS 128-compatible software first. Berkeley Softworks is introducing 128 (40/80-column compatible) versions of their spreadsheet, database, and professional word processor programs. Since these cost about the same as their 64 counterparts, I advise you use them instead of the older 64 copies.

Before these programs can be used within GEOS 128 they must first be installed—normally a simple operation. But GEOS 128 has one quirk you should be aware of which I discovered the hard way. I always hate to admit ignorance, so when it became time to install *geoWrite Workshop 128* into GEOS 128 I didn't want to ask anyone for help. I carefully followed every direction in the manual three or four times before I finally admitted defeat and gave Berkeley Softworks a call. The technical assistant told me that to install a 128 program I must first configure GEOS 128 to have 1541 drives (even though the program supports both the 1571 and 1581 drives as well). Performing the change is not difficult, but since the instructions don't tell you to do this (at least I couldn't find the information), installing new programs can turn into a head-scratching headache-generating ordeal.

Here's what to do if you are using 1571 drives like me: Select the configure 128 icon from the deskTop of the system disk. If you have already configured your program disk to use a 1571, you'll be alarmed to find the options screen offers only two choices now: no drive or 1571. But when you select no drive, the program will pause for a moment and then renew the screen with all four original options: no drive, 1541, 1571 and 1581. To get the program to allow installation of a new program you simply select the 1541 option and quit (no need to save your selections). After that little task *geoWrite Workshop 128* (or any program) will be installed.

At this writing, GEOS 128 is more a productivity station than an entertainment center. Almost all of the software which has been designed to work with GEOS (both the 64 and 128 version) are home/business programs like word processors, desktop publishing programs, databases, spreadsheets and the like. That should change in the future. Berkeley is actively recruiting programmers to develop a full line of commercial software, including entertainment titles, which will operate within GEOS' environment (they have even released a professional GEOS programming utility to spark more interest). The public domain outlets, BBS's like Q-Link, are already distributing a healthy collection of different types of software—free for the taking.

GEOS 128 is a wonderful operating system with one flaw—using non-GEOS commercial programs can be a problem. Because of the multitude of different protection schemes used by commercial software dealers, it is usually impossible to use them under GEOS control. However, if the software you want to use is plain vanilla BASIC or unprotected, you can install them and use them with GEOS 128 just as any other module.

The only regrets I have is that GEOS 128 has to be loaded (it *will* autoboot) each time I want to use it. I would prefer it on a cartridge, ready to go each time I turned the system on or (even better) on a chip installed within the 128. I mention this not just out of wishful thinking, but because it is possible. Every 128 has an empty socket in its circuit board just waiting for someone to use. I've tried commercial utility chips which do just that, so I know it is possible. Wouldn't it be great if you could easily upgrade your 128 to a GEOS 128 and simply never have to worry about damaging or loading a master disk again? There is an advantage for Berkeley here too—a chip would effectively end any software pirating worries they have for GEOS 128.

But regardless of how GEOS 128 is installed, it is a wonderful product. If you long for a friendlier interface than Commodore DOS or just want to impress your friends with the professionalism and power of your Commodore 128, this version of GEOS is your ticket. I picked GEOS 128 as the top 128 productivity software released in 1987 and it still looks like the best in 1988. ■

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Reviewed by Scott A. May

The Last Ninja

Computer: Commodore 64
Publisher: Activision
3885 Bohannon Drive
Menlo Park, CA 94025
Medium: Disk
Price: $34.95

Unlike other games with lifeless backgrounds, *The Last Ninja* contains more than 1000 moving objects.



Just when you thought the software market had reached a martial arts glut, along comes one of the best yet for eight bit computers. Activision's *The Last Ninja* breathes new life into an otherwise stagnant genre. What sets *The Last Ninja* apart from the pack is its unique storyboard structure, intelligent combat system and diverse player goals. This is not merely an exercise in fast fists and fleet feet. To succeed, players must capture the essence of martial arts—strength of mind, body and spirit. This may sound like hype, but it's entirely true.

The game's background story is rich with intrigue, magic and violence. You are the sole survivor of the Mystic Shadow Warriors, also known as the Brotherhood of the Ninja. Your friends and family—everyone you knew—were slaughtered by the evil Shogun Kunitoki and his Ashikaga Clan.

This tragic event took place during the Brotherhood's ten-year pilgrimage to the Island of Lin Fen. As fate would have it, you were chosen to remain behind, guarding the sacred Bunkinkan Shrine. You are now left alone with your thoughts and a burning hatred in your heart. As the last ninja, you must return to Lin Fen and seek revenge for your people.

The Island of Lin Fen is both beautiful and deadly. It is divided into six different regions, each one more treacherous than the last. The Shogun Kunitoki has stationed his men at every turn on your long, hard road to final justice.

Human opponents you can deal with. It's the inhuman kind that worry you. Demons of the Netherworld—controlled by Kunitoki—wait for you throughout the island. Only the absolute mastery of your ancient craft will see you through.

The Last Ninja is a single-player contest that offers outstanding long-term entertainment value. The game features more than 130 individual screens, each presented with superb detail and rich color graphics. The action unfolds one screen at a time, each at an unusual 45-degree angle—also known as the "*Zaxxon* view"—which allows players to move in and around the 3D landscape. The effect is somewhat disorienting at times, but therein lies part of the challenge.

On-screen animation also plays a large role in the game. Unlike other games with lifeless backgrounds, *The Last Ninja* contains more than 1000 moving objects. Animation is both fluid and natural. Not surprisingly, as the screens fill with life, the game becomes more deadly.

The island's regions divide the game into six progressively difficult challenges. Each region is loaded separately into memory, so disk access time is virtually nonexistent during play. The regions include: the Wastelands, the Wilderness, the Palace Gardens, the Dungeons, the Palace and the Inner Sanctum.

Although each region remains independent from the others—players cannot return after exiting a region—objects and skills found early in the game sometimes are not put into play until much later. The manual lists important objects you must find to complete your quest.

The exact use for each object, however, is not always clear. The game will not allow players to advance to the next region without gathering every object on that level. If unsure, consult the nearest shrine, but enter only in peace or face the penalty. Often one object is needed to acquire another. Valuable items briefly flash when players first enter the screen.

As an added bonus, each region also contains its own unique soundtrack. Together they comprise one of the most exquisite musical collections in recent memory. Sound may be turned off, but its value to the mood of the game is undeniable.

Despite some inviting background scenery, player movement is restricted to a narrow path that winds its way through each region. The path is usually clearly defined, although many times you'll appear to have reached a dead end. Here you must either backtrack to a different fork, or study the landscape more carefully for hidden methods of passage. At higher levels, particularly inside the palace dungeons, mapping is strongly suggested.

Due to the unusual player perspective and 3D graphics, your ninja is allowed to walk in eight directions, including backwards. Precise joystick control is required to win the game. Players must be able to achieve exact positioning to pick up many objects and fine-tune movements to surmount obstacles. The nature of many puzzles in the game leaves absolutely no margin for error. For this reason, some players will find *The Last Ninja* frustrating.

Combat movements offer an abbreviated version of the usual martial arts repertoire: duck, punch and kick. To defeat most opponents in this game, however, you'll need more than exploding fists. The designers have included a wide assortment of lethal weapons for you and your on-screen foes to play with, including: swords, staffs, numchukas, Shuriken (throwing) stars and smoke bombs. This variety of hand-to-hand combat propels *The Last Ninja* far above anything like it on the market.

Unfortunately, your enemy is also armed to the teeth and shows amazing prowess with the tools of the trade. To defeat Kunitoki's army you must be faster, smarter and stronger.

Cheating also helps. Striking first is the best way to inflict serious damage. But if

Continued on page 100

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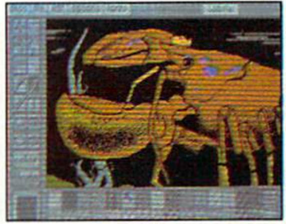
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Berkeley Softworks

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Reviewed by Scott A. May

Zig Zag

Computer: Commodore 64
Publisher: Spectrum Holobyte
2061 Challenger Drive
Alameda, CA 94501
Medium: Disk
Price: $24.95

This cross between *Zaxxon* and *Marble Madness* incorporates the best of two worlds for a totally new challenge.



For those who just can't get enough of the rat race, enter the realm of *Zig Zag*, a diabolically clever experiment in arcade madness. This one-player game will have you bouncing off the walls—literally—into the wee hours of the night.

Part of Spectrum Holobyte's International Series, *Zig Zag* appropriately represents the United Kingdom. The British have a thing for complex maze games. *Zig Zag* ranks among the biggest and best I've seen. This cross between *Zaxxon* and *Marble Madness* incorporates the best of two worlds for a totally new challenge.

True to some unwritten arcade credo, the game features a patently silly storyline about as thin as its instruction manual (four pages). This one outlines the player's role as supreme star pilot of the twelfth dimension, hyperspeeding your way through twisted corridors in the Matrix of Zog. Your mission: Survive enemy attacks and retrieve the Eight Crystals of Zog. Okay, sure thing.

The game's elaborate opening screen, complete with animated marquee and movie-like scrolling credits, is another British trademark. Often this is a dead giveaway to less-than-inspired graphics within. Not this time. The best is yet to come.

A second screen displays a high score list, various play options and game access codes. Game options are controlled by the function keys: F3 toggles between music and sound effects; F5 selects normal or reverse joystick modes; and F7 toggles between "Brain Teaser" and "Zapper" modes of play.

Joystick mode is a matter of personal taste, but I found the reversed method to be more natural—push forward to move down, back to move up.

Although there are no skill levels per se, the "Zapper" mode opens hidden passageways in the maze, giving novice players a slight edge. The game defaults to "Brain Teaser," where all traps and tricks await intact.

Finally, players may press the F1 key to enter "Save Codes"—access codes revealed during play in special "Save Zones." This allows you to begin the game from the Save Zone corresponding to a particular code. Like high scores, Save Codes are *not* saved to disk, so write them down for future play.

Once inside the Matrix of Zog, players are treated to a dazzling feast for the eyes and ears. The maze itself consists of wildly abstract architecture drawn in highly detailed, multi-layer designs. Brightly contrasting color schemes heighten the visual impact of this nightmarish labyrinth. Blind corners, dead ends, disappearing barriers, narrow avenues and multi-directional intersections are just a few of the surprises players must contend with.

The play area features the now-familiar *Zaxxon* perspective—a slightly skewed 45-degree angle above the action. Your ship is a curious wedge-shaped vehicle that flies at a steady pace but can only be moved up, down and sideways. To change directions, pilots must ricochet off walls or special prisms set into the floor. Prisms come in various shapes and allow 90- and 180-degree turns. Bouncing off most structures in the game is harmless to your ship. Pressing the fire button fires a laser blast.

In "Brain Teaser" mode, targets on the floor or wall trigger the appearance (and disappearance) of prisms and maze barriers. These items must be either turned on or off, depending on the situation. The Matrix of Zog also contains Time Locks which permanently close off certain sections of the maze. Players have 144 minutes (real time) before the locks shut down.

To collect a crystal, simply run over it. A display at the top of the screen keeps track of the number remaining. This display also lists your score, number of lives remaining, the current zone number, elapsed game time and status of the Time Locks. With so much to look at, what else could there possibly be?

Aliens. Lots of them, too. They appear from every direction and are usually not in the best of moods. The game's true 3D action requires players to fly above, below and around these swarming creatures. Touching them means instant death. But that's okay—their missiles will probably get you first. All aliens have somewhat unique attributes, best described by their names: zigzags, homers, drifters, attracters, bouncers, corkscrews and cubes.

Destroying aliens earns points and cash. Cash may be used in special "Shop Zones" to buy weapons of survival. These include U-turns, zaps (smart bombs), maps, extra lives, missiles, shields, raisers, infrared and X-ray vision.

U-turns are handy to have, especially when heading into something you'd really rather avoid. Maps help you locate areas yet unexplored, but are very hard to read. Shields are a must for serious pilots, making your ship invisible for five minutes at a time. "Raisers" force all aliens into the air, allowing you to fly by unharmed. Infrared vision is essential for the many dark zones, while X-ray vision allows you to see through walls.

Play is non-stop, fast and frantic. There is no rest for the weary (no pause control, in other words), but the Matrix of Zog is no place for arcade wimps. There are also no real playing tips other than (a) shoot everything that moves, and (b) attempt this game only when fully awake. The game is frustrating, yet strangely compelling and nearly hypnotic after prolonged play. Your computer screen soon becomes less of an arcade arena than some bizarre interactive art gallery.

Zig Zag should appeal to fast action gourmets with an affinity for games distinctively British. Don't let the fancy graphics fool you—this is a tough-as-nails challenge only the hardiest arcaders will endure. ■



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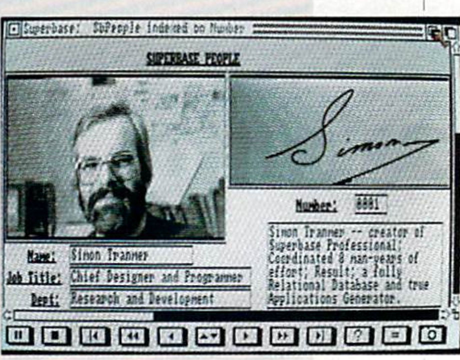
Cinemaware Corporation, 4165 Thousand Oaks Blvd., Westlake Village, CA 91362

Reviewed by Gary V. Fields

Superbase Professional

Computer: Amiga
Publisher: Precision, Inc.
8404 Sterling St.
Suite A
Irving, TX 75063
Price: $299.95





The size of the data files you create is limited not by the program but by your computer's memory and how many or what type (hard or floppy) drives you have attached.

The name *Superbase* should be alien to very few Commodore system users. Long before the birth of the Amiga, most of us who kept Commodores on our desks also had our serious files plugged into either *Superbase 64* or *Superbase 128*. When *Superbase Professional* was announced (it had been preceded by *Superbase Personal*) for the Amiga I expected a serious, power-packed, full-featured, programmable data management program. I was not disappointed—if anything I was overwhelmed.

To refer to *Superbase Professional* as merely a database would be tantamount to referring to George Washington as just another Colonial rebel. Washington led and won his revolution, and it appears *Superbase Professional* is leading its own revolution to establish the features a database management program should include and how they should be accessed. The main management program is supported by three application modules: text editor, forms editor and programming language. Combined, the four form the most powerful and flexible Amiga data management program on the market.

Superbase Professional is stored on three separate disks: program disk, forms editor disk and data disk (which has a few demo and help files). Along with the disks are two hefty manuals (each in excess of 200 pages). With all that, I suspect some users who are accustomed to programs which can fit on a single disk and manuals of under a hundred pages may be intimidated by *Superbase Professional*'s size and apparent complexity. If you are one of them, relax. You don't have to read *all* the manuals or know how to operate *all* the program's application modules to be able to input, sort and retrieve data or benefit from the main program. Don't look on all those pages and disks as complexity, instead look on them as meticulous support, complete with tutorials. Because *Superbase Professional* uses pull-down menus and is intuitively designed, most users should be able to begin using it without ever opening either manual. You really need to turn to the manuals only when you don't understand an option or when you are ready to get down to serious business.

The Main Program

Before you run out to buy your own copy of *Superbase Professional,* identify your exact needs. Just as you don't need a semi-truck to haul a few groceries, you won't need all the power of this product just to keep track of something as elementary as a personal address list. Remember, the largest word on the box is *Professional,* and it is not stamped there just to impress customers and improve sales. This is a full-featured professional-quality data management system, designed to handle serious business-sized data management chores. If you or your company requires a data management control product which is flexible, able to handle huge amounts of data, can operate on several files simultaneously (and swap and share information from all of them), is easy to set up yet allows records to be expanded when required and is simple to operate, read on.

As you would expect, the program supports all the standard alphanumeric field formats including date, time, read only, calculation and constant. Plus a field can be flagged to display IFF files (graphics or digitized images) or play a digitized sound. Why would anyone need a database which could display IFF files? A good prospect would be any company which sells over-the-counter parts. For example: when a customer comes in to replace a "broken what-cha-ma-call-it" rather than having to search through a warehouse of boxed parts, the salesperson could flip through the database's parts images until the customer recognized the needed item. Another location for such a database would be at a personnel check point in a security-sensitive area—the digitized image of an employee's face or signature could be recalled for positive identification. To go one step further, the sound of the person's voice could be compared against the same voice stored as a digitized sound.

Even without those unique features *Superbase Professional* is impressive. The size of the data files you create is limited not by the program but by your computer's memory and how many or what type (hard or floppy) drives you have attached. But to give some solid statistics to compare with, the program can handle up to 1000 fields in a record, and millions of records can make up a file (depending upon your drive situation). Each text field can handle up to 255 characters, and again the maximum number of files you can have open at one time is dependent solely upon your systems' memory.

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Continued on page 106

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Q-Ball

Computer: Amiga
Publisher: Mindscape, Inc.
3444 Dundee Road
Northbrook, IL 60062
Price: $29.95



Q-Ball is more than just a translation of the basic game to another dimension.

When I first heard about *Q-Ball*, I thought it would be yet another pool game. The only difference, I suspected, would be that the graphics and sound would be really good because of the power of the Amiga. Boy, was I wrong! The only elements of pool that are borrowed from *Q-Ball* are that you try to hit balls into pockets, and you use a cue ball to hit them. Other than that, you're dealing with an entirely new environment. *Q-Ball* places you inside a three-dimensional cube in which you must hit balls into the pockets in the eight corners of the cube.

Sounds kind of weird, doesn't it? Believe me, it is! Only after playing once or twice do you get used to the premise of playing pool inside a cube and forget that two-dimensional pool even exists. All of the pool games that I've ever seen for any computer have been pretty bad. The only computer games that have even come close to capturing the thrill of real pool have been in the arcade. Until someone decides to do an intelligent translation of one of these games to the Amiga computer, we have *Q-Ball* to keep us more than happy. Depending on how addicted I get, I may never want to play computer pool in two dimensions again!

The rules of *Q-Ball* are very simple. There are six red balls on the screen, one yellow ball and one black ball (cue ball). You use the cue ball to hit one or more red balls into the pockets (easier than it sounds). After dropping a red ball, you must knock the yellow ball in some pocket to score bonus points and prevent the lowering of your score. You continue this process of pocketing red balls and then the yellow ball, until there are no red balls left. Sinking the yellow ball finishes the game.

In order to facilitate making a shot, you are able to rotate the cube in any direction, so you can look into it from any vantage point. Mindscape claims on the outside of the package that there are 262,144 different viewing angles. This number should allow the shrewdest player to line up a shot. Rotating is (as the rest of the game) performed entirely with the keyboard. The arrow keys on your Amiga rotate the cube clockwise and counterclockwise or flip the cube over by 90 degrees. With these simple controls even a preschooler can be taught to play.

But don't think that you have as long as you want to line up a shot. There is a timer at the top of the screen. You are only given 60 seconds per shot, with the ball automatically fired after time runs out.

The timer has the greatest impact on your score. If you hit a yellow or red ball straight on, your score increases by the number of seconds remaining. If you knock in a red ball, you receive a number of points equal to (10 × timer + 500) points. Every additional ball sunk in the same shot adds another bonus to your score. If two balls are sunk, the base score of (10 × timer + 500) is added to 2 × (10 × timer + 500). Three balls would add 3 × (10 × timer + 500) to the combination of the totals in the previous sentence. When you pocket the yellow ball, you get (10 × timer + 2000) points.

You can see that knocking the ball in quickly will become a great asset in playing *Q-Ball*. Mastering this part of the game would require hours of practice. Fortunately, there are only six balls to knock in, so that a game goes pretty quickly if your shots are well chosen.

Don't think that everything you do in *Q-Ball* will *increase* your score. You can't expect everything! If you sink the wrong ball (e.g., you sink another red ball when you should pocket the yellow), scratch the cue ball or hit not one ball on any shot, your score decreases by 500 points. For the first few games, don't expect a very high score. Because the yellow ball is the last ball pocketed, the first few games will leave you with a score of (10 × timer + 2000) points on the screen. Unfortunately, only practice at shooting and thinking in three dimensions will get your point total higher.

The screen is set up very simply in *Q-Ball*. The cube itself takes up about half of the monitor. On the right side of the screen are the logo, message bar, power indicator bar, friction indicator bar, spin target and real/planer mode indicator. Each of these "gauges" has a specific purpose in the game and is altered when setting up a shot, if so desired. In setting up a shot, the keypad is used to enter all information. The ENTER key rotates through the five settings in the message bar: position cue ball, aim cue ball, set cue spin, set power and set friction. Any or all of these settings can be used or changed each shot.

At the beginning of any shot, you must position the cue ball. You use the directional keys on the keypad. Aiming the cue ball is your next priority. In this case, you use a "ghost" image of the cue ball to determine the place to where the actual cue ball will be shot. Again, the directional keys of the keypad are used, as well as two others that allow you to move the "ghost" image near you and far away from you in the cube to take full advantage of the three dimensions. Keep in mind also that while either aiming the cue ball or positioning the cue ball, you can rotate the view of the cube to line up your shot. The coordination of aiming and examining the cue is the skill that you should practice the most in *Q-Ball*. Hitting the RETURN key shoots the cue ball.

The three other settings on the message bar may be set at the beginning of the game on the first shot and left alone for the rest of the game. I would suggest that you experiment with spin, friction and power to discover what effect they have on the game. The two modes that you can play in are real and planer mode. In real mode, you use the full three dimensions, whereas in planer mode, you play as if on a two-dimensional table. Using planer mode will help you ease into three-dimensional play quicker. However, in planer mode, you have limited spin control on the ball. When setting the spin, you adjust crosshairs on the screen on a white ball to show where you want the spin to take place. Until you know how to shoot well in *Q-Ball*, leave the spin in the center. Just remember when using planer mode that top and bottom spin mean absolutely nothing.

The power setting determines how hard you hit the ball. Again, until you have control of each shot, leave the power setting at the high end of the indicator, for your chances of sinking a ball on the rebound are much better. Finally, the friction setting determines how long it takes for the air to slow the ball down. A large friction setting will stop the ball quicker than the other end of the indicator bar, which will keep the ball rolling for a long time after you shoot. Friction and power settings, as well as the spin and planer/real mode choices, should be changed only on the first shot until you realize how to change them later in the game to make better shots.

The graphics in *Q-Ball* are no less than superb. Three-dimensional programs are tough to develop, but the authors and programmers of this game have mastered that art. As a programmer, I know how tough it is to program motion control in two dimensions, let alone adding a new axis to worry about. Sound is not a necessity in Q-Ball, but music between games and during the demo is lively.

As soon as you play your first game of Q-Ball, you'll find yourself loading the game every now and then to practice your skills. Unlike other three-dimensional games, like 3D tic-tac-toe, *Q-Ball* is more than just a translation of the basic game to another dimension. It requires a new type of strategy and forces you to see things in an entirely different way. Don't worry about getting a high score the first few games. Rotate the cube to see the best direction in which to shoot and take full advantage of this unique, strategy-based, action pool game with a fresh approach in a software world of boring clones.

Finally, a word of thanks goes out to Milan McNeill for the nice letter he wrote to *Commodore Magazine* reviewers. Such enthusiasm for reviewing software was what got me started out here at *Commodore Magazine* and should point you in the same direction too. Seeing a letter like yours makes an already enjoyable "job" of reviewing software more worthwhile.


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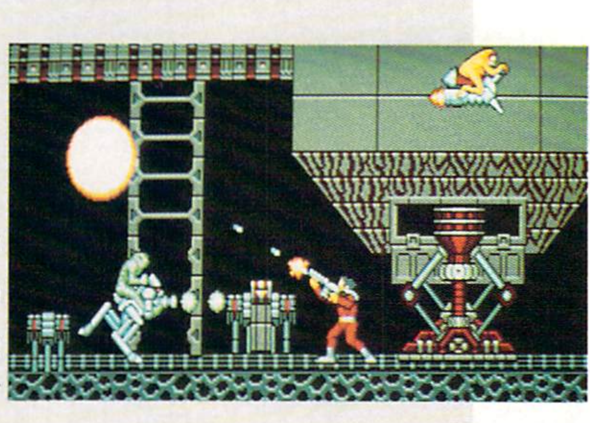

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Reviewed by Jeffery Scott Hall

Obliterator

Computer: Amiga
Publisher: Psygnosis, Ltd.
Distributor: Computer Software Services
2150 Executive Drive
Addison, IL 60101
Price: $39.95

You'll find the worst kind of space scum, aliens that are bent on revenge and will do anything to stop you from completing your mission.



As you stand in the Admiral's quarters awaiting your orders, you stare out into deep space wondering what could be so important. Just then, you hear the elevator doors slide open, the Admiral enters the room, faces you and says, "Drak, we are in need of your services once again. Our home planet earth is in extreme danger. An alien craft has been constructed to devastate the planet. I don't have to tell you that if this craft enters the orbit around our home planet we are doomed. The Federation has tried to stop them, but so far we have been unsuccessful."

Drak says in a soft voice, "So, now it is my turn to go onto the craft to disable it, correct?"

The Admiral sits down at his desk and says, "Yes, Drak, it is, for if you do not succeed in this mission, billions of lives will have been lost. I will get a shuttle to deliver you as close as possible to the alien craft. You will then be beamed over inside, along with one laser pistol."

Energize

As a light orange glow surrounds a section of space inside the alien craft, your body materializes. The transfer from the shuttle was a success, and you appear to be perfectly OK. There are no blueprints to the alien craft, so your location is unknown.

It is your duty to perform the following tasks to destroy the craft: First, you must find and remove four different pieces of equipment, which control the Plasma Drive Engines, Battle Shields, Main Weapons System and one Computer Datapack. The second task you must perform is to locate a shuttle component to the escape shuttle in order to leave the alien craft safely.

Once you have completed the above tasks, you will have a certain amount of time (depending upon your score) to make it to the escape shuttle. If you fail to do so, you will have saved Earth from destruction, but you will not have survived. Doesn't sound too difficult for a man of your qualifications, but there is just one small detail I left out . . . the enemy.

Your Challenge

When you search the ship you will find four things: special weapons, ammunition, shield-regenerators and space scum. You might be wondering what space scum is. It is the worst kind of space nasties—aliens that are bent on revenge and will do anything to stop you from completing your mission. You will find short aliens, tall aliens, skinny aliens, fat aliens, and short fat aliens, or any possible combination. One fact is certain, they are all ugly!

What is worse than a short, fat, ugly alien? That would have to be the robots and androids. These vile mechanical creatures are worse than aliens because of their tough outer casing, making them harder to destroy.

While we are speaking of destruction, all enemies will carry some sort of weapon. Some weapons will be simple semi-destructive lasers while others could be a cut-through-anything (and that means you) type of laser. Sounds too simple? How about throwing in some hidden traps for you to stumble upon?

You are provided with two items of protection. The first item you have is a laser pistol, and the second is an energy shield to help protect your body. However, with good news comes bad, for your laser pistol is fairly ineffective against most enemies you will encounter.

To help brighten your day, you will find special weapons, along with ammunition, located in certain areas of the alien ship. These weapons include a pistol, rifle, blaster and bazooka. The special weapons listed above are in the order of the least to the most destructive. You will also find Shield-Regenerators inside the alien craft. When you enter one of these, your body shield will be increased to maximum, and you will then have the opportunity to save the game. Watch out, bad guys, here comes the Obliterator!

Prepare for *Obliterator*

Your muscles stand out when you reach for your laser gun, it is now time to carry out the mission. As you walk (or run) you will find the screen scrolls smoothly (with no disk access) displaying another section of the alien ship. To control Drak, you can use either the mouse or joystick (not recommended).

You find yourself walking along the left corridor in a section of the alien ship when you hear a faint humming in the background. Suddenly, twin laser cannons come down from the ceiling and fire two rounds. Immediately, you go from a walk to a run and defend yourself. Your body hits the floor, curling up, still moving as the two lasers pass over your head. Not taking time to catch your breath, you continue to move. Then, you encounter an elevator leading to the level above. As you glance upward, you can see an alien clinging to the ceiling waiting for you. You decide that this one is extra tough as you put away your laser pistol and pull out your blaster. The elevator takes you to the top, where you exit with blaster in hand.

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Reviewed by Steve King

Pro Video Plus

Computer: Amiga (1MB)
Publisher: Shereff Systems
15075 S.W. Koll Pkwy.,
Suite G
Beaverton, OR 97006
Price: $299.95

It isn't often you can invest several hundred dollars and immediately make it worth over thirty times as much, but purchasing *Pro Video Plus* does just that. *Pro Video Plus* (*PVP*) is a professional video character and graphics generator that enables the Amiga to effectively compete with dedicated graphics computers costing upwards of $10,000.

When you observe *PVP* in action, the first thing you will notice is that the display is virtually flicker free—even though the Amiga is operating in high resolution interlace mode. This is not a miracle, but merely a well-thought-out combination of custom fonts and color placement. Unlike most other video programs, it is written in assembly language with interlace in mind. The result is a crisp, clear screen graphic. In addition, the transitions between screens are extraordinarily smooth, and the various effects are comparable to those seen on television.

Using *PVP* is fairly straightforward, but *PVP* doesn't use the mouse at all. In fact, you are told to hide it! Some die-hard Amiga users may think this a shortcoming, but in this program total keyboard control actually proves to be more effective and efficient. Moreover, the audience to whom Shereff Systems has targeted the program has traditionally used keyboard and function key controls and is quite comfortable in this mode. In *PVP*, there are essentially three steps in producing a finished presentation—Create, Link and Display.

Creating the Pages

PVP operates, in essence, as a page editor. It deals with "banks" of screen pages, stored in ten groups of ten pages. Each project, or job, consists of at least one bank. Depending on the amount of memory available, *PVP* can store and display 26 banks or 2600 pages! Each page you create must be individually configured by setting the vertical size of each line prior to entering text. At first this may appear tedious and cumbersome, however, it enables *PVP* to perform 60 page transitions which operate line by line. There are four different line sizes which can be combined in any order. You can enter up to twelve lines if you use the smallest size and no more than five if you use the largest.

PVP operates in the overscan mode with a total screen resolution of 672 × 440, although only 400 vertical scan lines can be used for text display. This produces an image which fills an entire screen without any borders.

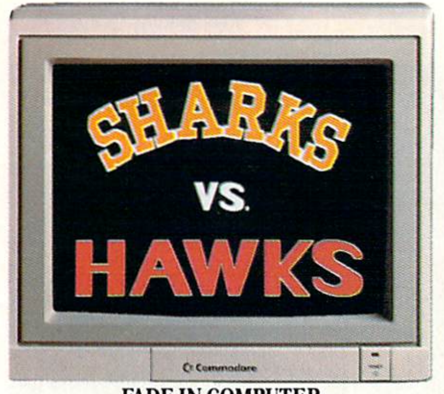
> *PVP* provides everything you need to obtain a truly professional result equivalent to anything you may see on television.

After selecting the size of your first line, you select the font size, one of four specially designed fonts (plus a graphic character set), and one of 16 colors. Now you can type your text to be displayed on the screen. A special function allows right, left or center justification once your text is displayed, either by line or by page. Another function allows you to move individual lines either on the same page or to other pages.

There are also numerous ways to embellish your text. You can underline it, or place it upon any one of the other 16 colors as a line background. The most creative tool, however, is the style function. This lets you edge the letters in complementary colors or produce directional shadowing or extrusions of varying depths. As you experiment with this function, your text line changes to reflect your choice. *PVP* also provides a function which produces text in preset multi-colored patterns, such as candy cane swirls or hammered metal. Color cycling and flashing are also supported. While there are only four different type styles (and you *cannot* use standard Amiga fonts), you can produce a myriad of effects by combining the basic fonts with the various styles, sizes, backgrounds and effects. JDK Images will be releasing diskettes of additional fonts which can be purchased separately.

There are several other options available to enhance your individual page. Although the default background is black, you can change it to any of the 16 colors. Needless to say, you can modify the palette to choose any 16 of the available 4096

Continued on page 100

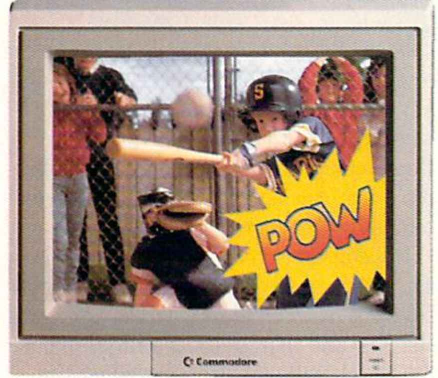


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Only Amiga Makes It Possible.

Reviewed by Graham Kinsey

HotLicks

Computer: Amiga
Publisher: Infinity Software
1144 65th Street
Suite C
Emeryville, CA 94608
Price: $49.95

HotLicks will allow you to load up to 20 instruments into memory at one time.



The Amiga doesn't have much trouble producing great music. Unfortunately the same doesn't apply for most Amiga *users*. Most of us can't read sheet music and can't tell the difference between a whole note and an eighth note—never mind tell where an A sharp note belongs on the staff. Most of us don't own MIDI keyboards either, making it impossible to take advantage of the many musical opportunities provided on an Amiga. Well there is hope for the masses: two companies have tried to create Amiga music programs that an average Joe can use. Attempt number one was *Instant Music* by Electronic Arts; it was the first music program for the Amiga that didn't assume you could read sheet music. Attempt number two is *HotLicks* by Infinity Software.

HotLicks is advertised as "The Amiga Keyboard Player." This is an important distinction, at least if you want to compare it to *Instant Music*. When you load *HotLicks* you will notice that the bottom portion of the screen is occupied by a five-octave keyboard with a couple of strange looking sliders above the keys. These sliders actually represent the two top and bottom rows of the Amiga keyboard. Not only can you use the regular keyboard to simulate playing a musical keyboard, but you can move these sliders to determine what octave range each two rows of Amiga keys will cover on the musical keyboard. The two sliders are not attached in any way, so you can have one slider cover the bottom fifth of the keyboard while the other slider covers the top fifth. Of course, you can also use the mouse to play music by simply clicking on any of the musical keys with a mouse button. You can even use the mouse and the Amiga keyboard simultaneously to play music.

While the bottom half of the *HotLicks* screen deals solely with inputing music, the top half has many control functions and other buttons. At the top left sits the display screen. Usually this screen shows the first five instruments loaded into memory and which of these you have selected to play on the keyboard. *HotLicks* will allow you to load up to 20 instruments into memory at one time, depending on the size of the instruments and how much free memory is available. This display screen is also used when you are loading in either a score or a new instrument to show the choices available.

Next to the display screen are slider controls for volume and tempo. The tempo control regulates how fast the music is displayed and controls the metronome. Since many of us are terrible at keeping time, *HotLicks* has a flashing metronome that helps you keep in time with the beat (when you are recording music, the flashing red light is accompanied by an audible click). The rest of the controls on the display deal with playing and editing a score. There are four different channels (corresponding with the Amiga's four audio channels). You control them with four black buttons that determine whether they will be played (if you're playing a score) or which channel you are currently recording/editing music in.

Below the four black channel buttons are over a dozen controls that are the heart of *HotLicks'* control panel. The Play and Edit buttons determine whether you are playing or recording/editing music. When in Play mode, you can choose between Solo, Chord or Arpeggiation modes to play from the keyboard. Solo is the default play mode and just means that one note is played for every musical key selected (no matter how you input that keypress). The other two modes alter how music is played when input from the bottom two rows of the Amiga keyboard. Chord play mode means that a set of three notes are played simultaneously when only one key is pressed. Arpeggiation play mode is similar to Chord play mode except the three musical notes are played one after the other (the length of each note is determined by the current tempo setting).

In addition to these three choices you can also load any of ten different internal rhythms (such as March, Waltz, Salsa and Reggae) and then select the Rhythm button which will play the selected rhythm while you play a lead instrument.

When in Edit mode there are other control buttons to use as well. There is a set of VCR-style controls (including a single-step button and a counter) for easy access of any location in the recorded track. There is a set of cut/copy/paste buttons that allows you to move sections of notes around within a certain track. There is also an Accompany button that will play the music present in the other three tracks while you record music in a fourth. And there is a button called One Button Play. This feature can help you if you like the notes you played, but you don't like the length of each note. One Button Play will automatically allow you to play each recorded note while altering the length of the note by playing it for only as long as you want.

The *HotLicks* screen also has a menu set. Besides the normal loading and saving of scores, rhythms and instruments (*HotLicks* naturally supports the IFF formats for musical scores and digitized instruments) there is an option to turn off the low-pass filter (for the Amiga 500 and 2000) in order to improve the fidelity of the music. *HotLicks* also allows you to save scores in two different format versions: a simpler version of IFF's SMUS

Continued on page 107

The Editor-in-Chief of the Australian Commodore and Amiga Review, Andrew Farrell, declares:

'Something is definitely wrong.'

Australia's disk digest, Suite 64, has changed that. A lot.

There are over 7 million Commodore 64 and 128 owners in North America alone, yet less than 1% of them subscribe to disk magazines. Something is definitely wrong and we know what it is.

Fresh input, imported-lacking

Current updates, latest private domain releases. Something totally different... New, fun, better, exciting, USEable. Inexpensive.

That's what disk magazines were supposed to be. Who wouldn't want to take advantage of this great innovation in Commodore software? Yet today disk magazines are laying idle, wasting a golden opportunity to benefit the users. Their potential not fully realized.

So take a look at Suite 64. Become aware of what the Australians have done for Commodore, for the better. A treasure chest for thinking people.

Why so good?

Firstly because it's so unique. Even our business and utility programs have that noticeable twist. Perhaps things like spread sheets, invoicers and so forth are done differently down there, new angles, particular needs. Could you use them? Check it out.

We've set out to give you a world of usable, worthwhile programs. A new world in each issue, New horizons to reach for and gratifying rewards for your efforts. We're positive that there will be at least one good program you'll be completely satisfied with. Each program alone exceeds the cost of the disk. Satisfied— yet, undoubtably, ecstatic overall.

$8,000 in 6 days at 17!

And the whizkid behind the software— Andrew Farrell (featured in the Sydney Harbor advertisements you've seen in the last two issues of this magazine). Maybe not as significant to computer history as Gates or Misner, but Andrew Farrell, 22, has made quite an impact in the Australian Commodore field.

At 16 he made the cover of Your Computer for outstanding achievement in high school computer education. At 17 he wrote his first "big" program in just 6 days and sold it to a software company for a cool $8,000.00 It was called The Typing Tutor and you can check it out for yourself in Issue One of Suite 64.

The reason it's so hot is Andrew's gifted art of constructing something as mundane as typing into a brilliant and exciting game. Look-out. You'll be hooked on this sensational new way of learning the keys. Learning, and having fun. And that's what it should be all about, right?

The Americas Cup Challenge

In February, 1987 Perth, Western Australia was host to Australia's defense of the America's Cup. To commemorate this historic yachting event one of the leading software publishing houses in the nation wanted to design an official computer game of the famous maritime battle. Obviously, Andrew Farrell was their premier selection. He still retains the copyright and it's your's in succeeding issues of Suite 64.

Editor-in-Chief of The Australian Commodore and Amiga Review and 1,000,000 in circulation

In 1983, at just 17 years of age, Farrell became the youngest computer magazine editor (probably the youngest editor of any magazine in the world, ever) of Australia's only surviving locally produced Commodore print magazine, The Australian Commodore and Amiga Review.

Additionally, he assumed Editorship of a new computer section in The Mirror, one of the nation's largest daily newspapers with circulation of over 1 million copies.

Prime Artifax & Commodore

Based in Sydney, New South Wales, Andrew Farrell now heads Prime Artifax, specialists in software engineering and technical essays. Their written programs range in as diverse a direction as medical accounting systems to limousine services data software

In 1987, Commodore Australia commissioned Farrell along with others to design a completely new computer training program that would begin in February 1988. He authored the courses and guidebooks and would later participate as instructor.

The kid knows what he's doing and he knows what people want.

What's in it for me?

You get the best.

Just as discerning and dedicated an editor has to be for something as specialized and technical as computers, Farrell makes sure your disk magazine is prime fillet. He's given you the finest of the local talent and the best of his own. This is not just local public domain stuff— this is our copyrighted software. The list goes delightfully on.

Educational tools that 64 and 128ers of all ages can benefit from including a 3D plot program that enables you to create 3D shapes using formula. Similar systems for the Amiga run as high as $125.00. Andrew's is included on our disk magazine with everything else for just $9.95.

Real Entertainment, NOT FILLERS

Suite 64 presents thrilling and active Aussie games. You would never have imagined that such quality would be available on a disk magazine format. But we have so much to give.

High speed danger from **Forest Raiders**, strategic action with **Road Block** and **Bert the Bug**, keeps the whole family amused. All on one disk. (Issue 1). **Star-gunner** takes you high above the hole in the Ozone layer to battle it out with aliens in the skies. (Issue 2).

Outback adventures! is a totally authentic Australian theme game. Lots of fun with The Sheep Station four player game. (Issue 2).

Immediate Advantages

Utilities and tools that meet your needs. Well-equipped home and business systems that will always come in handy. **Track and sector spread sheets** using DOS utility in full machine code. **Screen to basic** print-out capabilities, **Nice lister** formats printer control codes and a function key program that gives C64, C128 F-Keys, all in full machine code.

Then there's the **Appointment Manager** with Diary and Calendar, plus **Little Invoicer** for efficient business invoicing. All on one disk! Excellent!

Issue 2 features the unusual **Construct-A-Brix** drawing programs for the young and young at heart.

Sprite editor & driver lets you include Animator Spriter in your own basic program.

Home budgeting, border maker and **digitized Amiga pictures, fun graphics and music demos. Joystick reader and tester** and so much more! Each disk double-sided and crammed full every issue. All for a ridiculous $9.95.

Very Australian — Very Unique.

What an interesting difference seeing this Commodore software from another land. The Australian flavor wafts through right into the refreshing editorial from Farrell and others on his staff. Latest information, helpful hints and an insight into the wonderfulness of this planet's biggest island. There's plenty of our favorite graphics and music including Waltzing Matilda, programs from Europe and an out and about Sydney guide. And they're available now. Issue One and Issue Two getting even better. How can it be just $9.95?

Thank all the contributors from all over Australia for that. An opportunity to exhibit their efforts to the world is rare. Suite 64 makes it possible. Andrew Farrell's key position in the Commodore marketplace gives him access to some of the best Commodore programmers in Australia. Additionally, direct to you via subscription cuts down tremendous operating costs that would normally have been absorbed in the price. It's that simple.

But Hurry

Take advantage of our lower currency rate of exchange to the U.S. dollar this month and **order now. 1 Issue just $9.95** + $1.50 shipping & handling. **Issues 1, 2, 3, 4, 5 & 6 special rate $49.75** + shipping & handling.

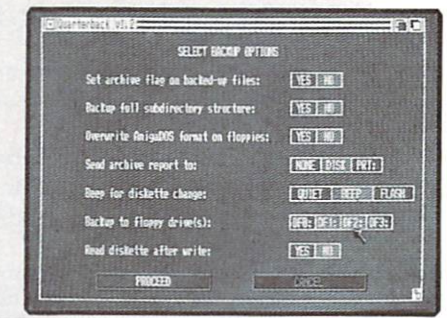
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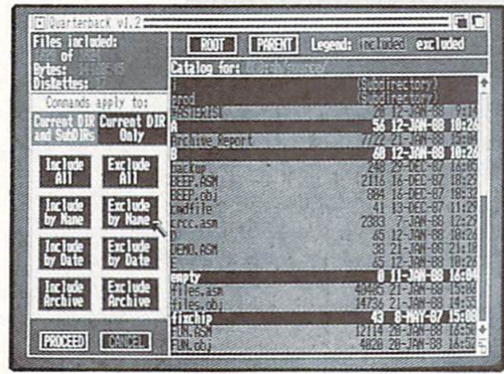
Suite 64, the thinking person's disk magazine. Your computer does so much for you — now do something for your computer.

Reviewed by Dan Schein

Quarterback

Computer: Amiga
Publisher: Central Coast Software
268 Bowie Drive
Los Osos, CA 93402
Price: $69.95





The hard-drive equipped Amiga has been experiencing a rapid growth rate over the past year thanks to the introduction of the Amiga 2000 along with its wide range of hard drives and controllers currently available. Not to be left out, the Amiga 1000 and 500 have also had many recent options available for adding a hard drive. This means that there are more Amigas equipped with hard drives today than ever, and that number is increasing daily.

Anyone who owns one will tell you that a hard drive is an invaluable tool. Most hard drive users find the extra storage space (not to mention the increased speed over floppies) an invitation hard to refuse. Before long you find yourself copying all your commonly-used software and utilities onto your hard drive. During this time, odds are you have written and saved quite a few letters, programs (source code), drawings and animations to that hard drive.

Well as any experienced hard drive user will also tell you, failures can occur. Like with any other thing that goes wrong with a computer, hard drive failures have a way of occurring at the worst possible moments. Imagine this:

You just finished that final section of code for your latest program, FuBar Plus. (This is the one that's going to make you rich and famous!) You start to compile your code, and suddenly a requestor pops up telling you that your hard drive has a read/write error. You click on retry, and the requestor just keeps coming back. By now you realize that the only copy of FuBar Plus (8+ months of work) is on that hard drive and you have *no* backups.

You may think that this will never happen to you or that it was a bit harsh. Well, you would be wrong on both counts! Hard drive problems happen to *all* users sooner or later. Those who are prepared (with a current backup) survive with only a minor inconvenience. But the unprepared user will suffer dearly through the loss of data and programs. A time like this need not be the end of the world if you have a backup of your hard drive.

Quarterback is a hard drive backup and restore utility for the Amiga. It works on all models of the Amiga and will run on a machine with as little as 512K of memory.

Part of what makes *Quarterback* so powerful is its ability to do either a full backup of everything on your hard drive or a selective backup.

I found *Quarterback* very easy to use yet powerful and—most importantly—very quick. Part of what makes *Quarterback* so powerful is its ability to do either a full backup (or restore) of everything on your hard drive or a selective backup (or restore) of only those files and/or directories that you select. *Quarterback* can back up most types of hard drive configurations, I have tested it with DHx: devices (normal Amiga hard drives like those found in a 2000), JHx: devices (those in a Sidecar or Bridgeboard), and Fast File System devices available under AmigaDOS V1.3.

Anyone familiar with Intuition will be able to sit down and start backing up their hard drive in less that five minutes. A nice feature of *Quarterback* is its ability to run from either CLI or Workbench. From the first screen you get the feeling that *Quarterback* was written to be an easy-to-use program; the first screen offers you only two choices: Backup to floppies and Restore from floppies.

Let's examine making a backup. After selecting the option you are requested to enter the name of the device you wish to back up. Enter the device name and click on either PROCEED or ABORT. After selecting PROCEED you will see *Quarterback* building a catalog of all the files on the selected device along with a number indicating the files cataloged. Next you are presented with (what I call) the master screen. This is where you decide exactly what gets backed up and what doesn't. You can select options like Current Dir Only or Current Dir and SubDir's, Include/Exclude All, Include/Exclude By Name, Include/Exclude By Date, Include/Exclude Archive. On this master screen is also a listing of your disk's directory. With this directory it's easy to see just what files are on your hard drive and where they are. When you have finished selecting what files are to be backed up, you select PROCEED to move on to the next screen.

This next (and final) screen is where *you* select the backup options. These options include things like setting the archive bit on files backed up, getting an archive report, overwriting AmigaDOS for-

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Reviewed by John Pustai

Flexidraw 5.5 Light Pen System

Computer: Commodore 64/128
Publisher: Inkwell Systems
5710 Ruffin Road
San Diego, CA 92123-1013
Medium: Light Pen/Disk
Prices: 170-C light pen: $99.95
Flexidraw 5.5: $34.95



The Inkwell Systems 170-C light pen (top) is a new version of the popular industrial quality light pen. The Inkwell Systems 184-C light pen (bottom) features tri-lobular design and two touch surface switches.

If you want one system for your Commodore 64 that will combine the functionality of *Print Shop,* the impressive productivity of *Newsroom* and the creativity of Koala Pad, then the Flexidraw light pen system is for you.

This system is composed of the separately-sold *Flexidraw version 5.5* software and the model 170-C joystick-port light pen. It is this system that I thoroughly tested, becoming more and more impressed after each test. In addition to the light pen, the *Flexidraw* software supports a mouse, a Koala Pad or a joystick as data input devices.

The package includes a very full two-sided disk, a well-written and excellently organized 80-page manual, and a much-needed function key overlay. In addition to the main *Flexidraw* artwork program, the front of the disk contains a copy program, a transmit/receive program, a sprite editor/animator program, a color artwork program, and BASIC-interacting and plotting programs. The back side of the disk is packed with picture, font, pattern and tutorial files.

Initial Setup

The copy program can be used to back up any non-copy-protected software. When using the program for the first time, you will make a backup working copy of both sides of the disk and will set the correct printer drivers.

Once the main program is loaded, an initial menu offers the following choices: draw picture, add color, send picture over modem, show picture, copy *Flexidraw* or set preferences for the printer. In addition to supporting about 20 printer varieties and printer interfaces, *Flexidraw* also supports the Sweet-P plotter and the Commodore 1520 plotter. After making the main menu choice, you are asked to choose the input device from a second main menu. Depending on the device, the connection is made into either joystick port 1 or port 2.

> With any of the input devices, the functions built into the *Flexidraw* package almost boggle the mind.

I tested model 170-C Inkwell Light Pen, the Koala Pad and the joystick for ease of use as input devices. With the light pen data is entered by pressing and holding the nose of the pen against the monitor screen. However, if you don't want to hold the pen against the screen, you can simply hold down the CTRL key, make sure the pen is less than three inches from the screen, and then simply draw your picture. This CTRL-key capability also allows for excellent freehand sketching or air-brushing effects.

Of all three input devices tested, only the light pen needs to be calibrated to the monitor before it can be used properly. However, this calibration is easily completed by simply touching the light pen to a programmed line on the screen to locate the home or zero position. A successful "touch" will move the program to load the next screen—the drawing area.

If the pen fails to calibrate, increase the brightness level of the screen or check the pen tip for dust accumulation. Calibration of the light pen may be done at any time by pressing RUN/STOP and RESTORE simultaneously and the following the initial calibration procedure.

Changing input devices while the program is running is possible by holding down the COMMODORE key and SHIFT key while pressing "M" for mouse, "J" for joystick, "L" for light pen and "P" for Koala pad or data tablet. It is also possible to connect two input devices to the computer at the same time, as long as the light pen is always in port 1. Once you have hooked up the input device, you should turn up the monitor volume, for some nice prompts sound whenever you input menu selections.

Capabilities Abound

With any of the input devices, the functions built into the *Flexidraw* package almost boggle the mind. Use of the first-rate, easy-to-use manual is almost a must, until hours of hands-on operation develop a second-nature technique. Discussion of over 65 special functions takes up an impressive 25 (5½ × 8½ inch) manual pages.

For easy reference, each of the function sections in the manual has the title written in bold and is identified with a solid black dot. At each of the function sections is the usual text description. Also, under each function, is a picture of what you expect to see on the screen to successfully invoke the actual function. Within the function text description, the use of any special function key is highlighted by a graphic which represents the actual function key. Actual use of all of the functions is easy by just following some simple steps: (1) determine what it is you want to do, (2) go to that section of the manual, and (3) follow the straightforward instructions.

Even with this straightforward procedure, I strongly recommend that the first-time user experiment with each of the functions before doing any serious work. If your children will be using the system, you should sit down and guide them through all of the functions at least once. This will enable them to have a visual memory of every function. Then if they forget how to do one thing or another, they can easily refer to the manual.

Some of the more interesting functions include a split-screen function. If you want to connect your drawings together side-by-side or you want to make one long continuous picture as your fan-fold paper is feeding through, the people at Inkwell have thought of you. There is a Split Screen–Right/Left and a Split Screen–Up/Down function.

This split-screen capability enables you to see the right side of the first page and

the left side of the second page on the same screen. Or in the case of the Up/Down mode, there is a display of the bottom half of the first page and the top half of the second page. With this screen setup, you can draw continuously from one page to the next, to get a continuous picture when you print out each screen.

If you want to add an airbrush or dappled effect to your drawing, a Spray command is available. Invoking the Filter mode slows down the response time of the movements of the pen or input device, giving a smoother air-brushing or sketch line on the work area. There is also a Cross command that establishes crosshairs in the work area. With these crosshairs, you can easily align drawings and text or position previously-copied objects or clip art.

Special geometric shapes are also built into the software. The selection of Boxes, Curves, Arcs and Circles will get you the obvious results. Even accurate ellipses of any shape are easily made by first drawing a box defining the limits of the ellipse, then simply invoking the Curves and Ellipse functions.

Single pixel changes to any drawing is made possible with the Zoom command. Fill allows you to completely enclose black or white areas with the opposite color. Fill, in combination with a menu-available artistic pattern, enables a portion of your drawing to be filled in with that pattern. Special grid patterns are also available. Even special shading over part of the artwork or on selected edges of the artwork is possible.

Images, Fonts and Color

Flexidraw allows you to horizontally or vertically flip or rotate images 90 degrees, or Copy and Paste images. Images that are to be copied in the work area are first saved to a hidden Scratch Pad area. With the Paste function you can even test the image location before final pasting in place, overlay images that allow one image to be transparent over another, or overlay images where only the top-most image is completely visible. Aborting or Undoing any of the functions is possible if you want to change your picture or find that you have made a mistake.

Adding text to any drawing is possible. In fact, alpha-numerics are treated just like any graphic, and can be copied, pasted, rotated, flipped or undone. All of the graphics on the keyboard can be used with the correct combination of SHIFT and COMMODORE keys. Fifteen font styles including Old English and Times, 14 pattern files, and a Greek alphabet file can be loaded to call up with the Font menu listing. Additional font styles can be entered from Inkwell's *Flexifont* software (not included in the *Flexidraw* package). *Flexifont* can also be used to capture and use public domain clip art for use in *Flexidraw.* Any of the font styles can be mixed on the screen.

The hardest part of this program is thinking about your idea. After that, it's a cinch.

All of these special font or graphic files are accessed from the *Flexidraw Filer* program with the F8 function key. Also, through this technique, you can save and load your drawings, list the directory, erase the entire disk or format a new disk.

For scientists and circuit designers, there are special treats. Scientists have access to a special mathematical library of symbols. These symbols include calculus integral signs of all sizes, radical signs of all sizes, infinity signs, and brackets and parenthesis. For circuit designers a schematic library includes a multitude of analog and digital electronic schematic symbols. The Copy and Paste selections allow any layout desired with these special files.

If you think we've covered all of the programs in this *Flexidraw* package, you're wrong. For example, there is the *Pen Palette* program that allows the colorization of any picture or picture/text/symbol piece or artwork. The painting system is based on simultaneously selecting a combination of two colors. One color will be the color of the background. You can pick and choose any two color combinations and also select 23 combinations of colors. With care, you'll be able to paint your pictures exactly as you want.

Inkwell Systems has included five *Pen Palette* tutorial files on the picture disk. Because the *Pen Palette* program is a little confusing, I highly recommend that you go through these five tutorials. The fifth tutorial was a painting test, that I somehow completed correctly. But to tell the truth, I'm still not totally sure how I did it.

If you think the list of functions above is enough to warrant purchase of the software, there is still more to come. A Sprite package is also included. With this package you can: (1) design your own sprites, just by drawing on the screen, (2) save the sprite data to disk for use in your own program, and (3) put a collection of your sprites together and animate them. The hardest part of this program is thinking about your idea. After that, it's a cinch.

There is yet another program module in the package called *Transgraph* which allows *Flexidraw* users to swap their pictures via the phone lines. For normal telephone lines, transmission of a single typical picture usually takes about eight minutes. However, there is a "packaged mode" of transmission that takes less time, but requires the connected phone lines to be of excellent quality.

For programmers with a good working knowledge of the BASIC language, there is also a machine language program called *Flexiplot.* This program is a set of high-resolution drawing subroutines from *Flexidraw* that have been modified to be easily callable from BASIC programs. The subroutines allow you to quickly clear the high-resolution screen, plot points, or draw lines and circles.

If you want to load your *Flexidraw* artwork in a BASIC program that you have written, then it is saved as a stand-alone file, using still another program—*Show Picture.* The *Flexidraw* manual gives you the BASIC program needed to load the artwork file.

Show Picture itself is used only to display black and white or color artwork created with *Flexidraw,* without having to run the *Flexidraw* or *Pen Palette* program. If you want to have a continuously running display of all your artwork, this is the program to use. You may even want to make a series of slide presentations, run them under the *Show Picture* program, and then videotape them for a business presentation. What is even more amazing about this set up is that if you are running *Show Picture* in the computer, you can hook up the light pen and use it as a pointer.

Only Minor Problems

After an extensive battery of tests that included the light pen, a Koala Pad and a joystick as input devices, I found only very minor problems—mostly associated with the editing of the manual itself. For example, the manual indicates the loading of the "PATTERN" file, but it is the "PATTERNS" file that must be loaded. There is no code sheet that shows what keyboard letter to hit to get a particular Greek letter font.

The file names of the *Pen Palette* files are incorrectly named in the manual. The

Continued on page 58

by Shay Addams

Quest for Sequels, Part II

News and opinion from a leading explorer of those fantasy realms called adventure games.


DENISE FALESKI VITOLLO

After slaying a couple hundred orcs, dragons and assorted trolls and kobolds in the original version of *Bard's Tale III: Thief of Fate* and *Ultima V: Warriors of Destiny,* I can offer some insights into what to expect when they're converted for the 64. I was happy to see some interesting new elements in both games.

The most significant change in *Bard's Tale III* is the ability to use objects in order to solve puzzles—and there are plenty of puzzles to solve. It starts when you find the town of Skara Brae in ruins, devastated by the Mad God of the first game. In the remains of the Review Board, you'll meet an old man who sends you on a series of seven quests.

Each quest involves traveling through time and space to another dimension. In order to do so, you've got to build up a spellcaster so he (or she—this is the first *Bard's Tale* in which you can create female characters) qualifies for changing to a Chronomancer, whose spells facilitate time travel. Another new magic class is the Geomancer. Their new spells, combined with those for the five other magic classes, add up to over 100 spells. Members of the other magic classes also have a number of new spells at their command.

Auto-mapping is a welcome addition. This convenient feature draws a map of the maze on the right side of the screen while on the left you see a three-dimensional view of the current location. It's especially useful here, for the mazes—there are 84 dungeon levels to map—vary in size, from 4 × 4 up to the 21 × 21 of previous games in the series.

With the ability to use items, you'll find the puzzles more like those in a text adventure. And thankfully, there are none of *Bard II*'s dreaded "Snares of Death"—those deadly rooms in which your party was wiped out if you didn't solve the puzzle within a time limit. Essentially, it's a lot closer to the first game in difficulty, and certainly a more satisfying, less frustrating challenge than the second one. One considerate feature makes it even more fun to play—you can save the game while inside a dungeon, so you don't have to trudge all the way back to a Guild when you want to quit.

Artist Todd Camasta, who worked on *Wasteland,* did excellent work on the pictures of the monsters and characters. It's worth noting that the *Wasteland* conversion (from the Apple, which was in four colors) was re-inked in 16 colors for the 64. Hopefully that will also happen with *Bard's Tale III.* Text is stressed more than in any game in the series, and numerous scrolling screens are filled with game designer Mike Stackpole's fluid prose. *Thief of Fate* may be out for the 64 by now and will eventually be converted for the Amiga. (*Bard's Tale II* for the Amiga has just been released at this writing.)

Ultima V: Warriors of Destiny

I also ventured forth into Britannia in *Ultima V,* which exhibits even bolder changes. The most innovative one involves time. Most games that include a day and night cycle don't really do much with it. In *Faery Tale Adventure* and *Alternate Reality,* for example, the only difference was that you ran into more monsters at night, and perhaps your field of vision was diminished. That's true for the outdoor scenes in *Ultima V,* but indoors is a different interactive story altogether.

As time passes, you'll notice that each character in every town acts according to a specific schedule as he or she goes about the daily tasks of their particular profession. This might entail waking up at home, walking to work and engaging in other activities throughout the day. Paying attention to each individual's routine is vital to solving certain puzzles. I'm sure you can see the value in observing the habits of guards that patrol a room or block passage to a door. Other instances are more subtle.

This is the first time Richard Garriott has set an *Ultima* sequel in virtually the same game world as the preceding installment. Britannia towns and villages, though their interiors have been greatly expanded and embellished upon, are located in the same places on the same surface map seen in *Ultima IV.* The plot is linked to that game, whose goal was to recover the Codex of Ultimate Wisdom. Bringing it to the surface opened passageways to the Underworld, a vast subterranean region that is as big as the surface world of Britannia. While exploring it, Lord British was captured by evil fiends and is missing in action. Your long-range goal is to find and save him. You have been summoned back to Britannia to rescue the King. It's assumed you already became an Avatar in *Ultima IV,* but you don't need to have played that game to have fun with this one (I still highly recommend it, though). You can start wit. a new character or import your existing Avatar.

A myriad of new features are found in the graphics department: animated waterfalls, clocks that chime the time, smoother coastlines and lots more objects in the castles and other locations. The combat system was upgraded to let you fire missile weapons diagonally at monsters instead of just in the four compass directions, and you've got to master Latin "root words" for spells and combine them to form a spell's complete name. There are some new spells, but you still need to find the ingredients as in *Ultima IV.* You'll hear a dozen original musical themes. (Apple owners have to shell out a couple hundred dollars for a sound board in order to hear more than beeps and clicks!)

Questron II: Back to the Book

Here we've got a strange plot twist: In *Questron I* your goal was to destroy the Book of Evil Magic. Now you learn it wasn't actually destroyed at all, so you must travel back through time to prevent it from being created. The magic and combat systems are similar, though more detailed, and you've still got that handy joystick interface.

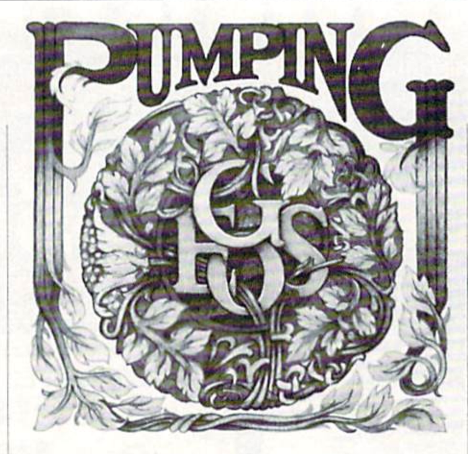
Graphics are much better looking. Monsters grow larger as they draw nearer, and they're brought to life by some nice spot animation. Another big difference is that the interiors of towns are shown in scroll-

Continued on page 99

by Mark Jordan

Paint Drivers

Berkeley Softworks' series of GEOS-compatible products opens up a world of opportunity to Commodore users. Take some tips from Mark Jordan and soon you too will be Pumping GEOS.



If you're a *geoWrite 2.1* owner but don't have *geoPublish* yet, you can still do some pretty fancy multiple-column documents with inserted graphics that will look pretty darn close to *geoPublish*ed pages. It is a bit tricky and takes some practice, but after you get on to the process, it does the job quite nicely.

The key to the procedure is the Paint Drivers that come with *geoWrite 2.1*. The manual devotes a mere 2½ pages to explaining their use—too few indeed for the less than hardy. It took me hours to figure out how to get these drivers to work. I couldn't understand what they were supposed to do until I had re-read that section of the manual about ten times.

So let me try to make it easier on you. Here is the lowdown on Paint Drivers.

Paint Drivers: What They Are

Paint Drivers are pseudo-printer drivers. Once installed and selected, instead of actually printing your *geoWrite* (or *geoPaint*) document to the printer, they'll print them to a *geoPaint* file. There are two different Paint Drivers: Paint Overlay and Paint Pages. They perform slightly differently but both have the same basic function: they allow you to convert your *geoWrite* files into *geoPaint* files. If you can imagine printing several documents to an imaginary sheet of paper on the disk, you'll have an idea what the Paint Drivers do.

Let me elaborate. When you create files with *geoWrite* (even though *geoWrite* uses bitmapped graphics) the computer still stores your file as characters. GEOS converts the characters into the proper bits as it displays them. *GeoPaint* files, on the other hand, are stored bit by bit. That's why you may have noticed your *geoPaint* files are so much longer than single-page *geoWrite* files.

Paint Drivers convert the *geoWrite* information into *geoPaint*'s bit by bit format. The advantage here is that once you've got your *geoWrite* file into *geoPaint* format, you can use all of *geoPaint*'s graphic capabilities on it. And if you use the Paint Overlay driver, you can convert several *geoWrite* files onto the same *geoPaint* file.

Now that you understand the theory, let's take a look at the process.

The first thing you must do is to copy the Paint Driver icon from your *geoWrite* disk onto your work disk. This the manual explains clearly.

The second thing you should do is double click that icon and follow the prompts. The manual doesn't make this so clear.

The third thing you must do is select the driver you want (similar to golf except you only have two clubs) by going to the GEOS menu and choosing Select Printer.

That done, you are ready to convert any *geoWrite* (or *geoPaint*—more on that later) files into *geoPaint* files. Simply load your *geoWrite* file and print it. When you return to the deskTop you will discover you have created a new *geoPaint* file. Now pay attention: the file created will be named "OVERLAY" (all caps) if you're using the Paint Overlay driver or "PAGE" (with the appropriate page number after it) if you're using Paint Pages.

You must be careful with Paint Overlay. Once you have your document exactly the way you want it, if you forget to change the printer driver back to whatever you normally use, you will overwrite your perfected Paint Overlay file the next time you try to print anything. Avoid that in two ways: once you have your Paint Overlay file perfected, change its name (click its icon once and choose RENAME from the File menu) and change your printer driver back to the one you normally use.

Paint Pages will create one page of a *geoPaint* document for each page of the document you are using it on. For example, if you have a three-page *geoWrite* document you want to make into a three-page *geoPaint* document, using Pages will create three *geoPaint* files named Page1, Page2 and Page3. If, on the other hand, you chose Paint Overlay as your psuedo-driver, you would create just a single *geoPaint* document with all three of your original pages on it, one on top of the other . . . kind of like Japanese beetles.

Now you may be able to see how you can start to create multiple-column documents. Simply create a two-plus page document with *geoWrite* and set the margins for each page to create a left or right column then print them all to Paint Overlay. If you'll look at the sample document that I've created here ("For Expert Computer Users Only." And don't be offended if you're a newcomer; it's all in fun—heh-heh.) you will note that I've not only created a two-column page but I've also incorporated a cartoon in it with the text neatly formatted around it.

What follows is a blow-by-blow account of how I produced "For Expert Computer Users Only," complete with tips, hints and warnings of potential pitfalls.

Round 1: Getting Your Disk Prepared

Step 1: I formatted a disk. Since I have a 1571, I want to use both sides so I did just that.

Step 2: I copied the Paint Driver file from my *geoWrite* disk to this disk.

Step 3: I double clicked my Paint Driver icon.

Step 4: I went to the GEOS menu and changed my printer to Paint Overlay.

Ding! Thus ends round 1.

Round 2: Getting Your *geoWrite* Document Prepared, Page 1

Step 1: I wrote my *geoWrite* document, "For Expert Computer Users Only."

Step 2: I reset my margins to create a single column of text which would consume a little less than half a page. To be exact, I set the left margin to .2 (the default) and the right margin to 4.0. This left me with a 3.8" column of text. Then I set the entire document in University 10 .

Step 3: I went down to line 32 of my page and reset my margins at that point to create a skinnier column. All I did was move the right margin in to 2.1. If line 32 happens to be in the middle of a paragraph, you're going to have to do some juggling because resetting margins in the middle of a paragraph will reset the margins for the whole paragraph. Here's how

Continued on page 101

For Expert Computer Users Only

To all of you who have owned your Commodore for over two years, I have some good news. The rest of you -- skip on down to the bottom of the page where the asterisk is. The bulk of this article is quite technical.

(Are they gone yet? Good.)

At last you are going to have a real reason for owning a personal computer, one that you can be proud of. I'm not talking about increased productivity, mental stimulation, or any of that bull. I'm talking Power. Yes, you are about to become one of the few, the proud, the COMPUTER DESPOTS. (Despot: noun. A ruler having absolute power, a tyrant or oppressor.)

Here's why. We are just now in the twilight of Wave 1 computing. That's the phase where all the intelligent people (like you and me) went out and bought computers just for the heck of it. We played games, typed in programs, and began acquiring knowledge in mega-doses. Ah, those were the glory days.

Then something terrible happened: we burned out. Computer overdose. Could this be true? We had given hours to our CPUs, where was the return on our investment?

It is here, it is now, and it is in the form of INTIMIDATION. Because Wave 2 is kicking in even as I speak. First, some facts about Wave 2 users.

1) They just bought their computers.
2) They don't know anything about them.
3) They are scared of people that do know about computers.

What a great situation for you and me to be in. Finally (and this only happens about once in several generations), we have a chance to TOTALLY CONTROL OTHER PEOPLE.

This is the greatest. But there is a technique involved in tyranically ruling other human beings. Here's how I did this recently:

Me: I've been getting some glitches on my serial bus.
Wave 2'er: What's a serial bus?
Me: You don't know! Have you used your computer yet? I just hope it isn't too late.
Wave 2'er: Too late for what!
Me: You had to ask. You may have zapped out the ROM on the 8377, or, at the very least, you may have caused a high pull voltage drop on pin 17.
Wave 2'er: Oh no! Is my computer ruined?
Me: Yes.



You'll note how I lured the novice into my trap with some ridiculous argot. It isn't the least bit important that you make any sense at all. In fact, the more phony your talk, the more it seems to reel them in. Basically, all you really need to do is to throw around a few of the terms you've heard over the years like ROM and RAM, raster interrupts, cathode ray tube, DOS wedge, and case sensitivity.

You may be thinking, "Hey, this isn't right. These Wave 2 people haven't done anything to me. Why should I destroy them? Why not help them with their questions, share my knowledge?"

Yeah, yeah, yeah. It sounds great on paper. But just wait till one of them asks you to help him. Just wait till you see him grab a disk by the disk surface and stick it in his computer sideways. I want to be there when he yanks a cartridge in and out while the computer's on, while YOUR computer's on. And I want to see your brotherly love when he tries to plug the joystick in upside down -- and succeeds.

Are you getting the point now? These people are dangerous. Wave 2'ers don't read manuals, they don't buy computer books, and they don't (thank goodness) read past the first paragraph of articles like this one. They deserve whatever you can dish out, so start dishing. Besides, remember back to when you first started using your computer. Remember all those Wave 0 people who tossed technical words around like Italian chefs toss pizzas?

Remember the sneers and snide comments? Now it's your turn, baby, and revenge is sweet.

Anyway, there's even a better reason why you should dominate this new group of computer users. Once you've bossed a few of them around awhile you'll eventually get a reputation as a SMART GUY. This has to do with something called the Stockholm Syndrome where captives begin to worship their captors. At any rate, once you're known as an expert the next step is to become a consultant. Then you can move to Washington, D.C. where all the other people who don't actually work live.

So the good news is that you can now finally achieve what every man inwardly strives to achieve: absolute rule. And you can thank me for it.

* * * *

* Okay all you new computer people, you can start reading again. How many of you have had problems with serial bus glitches? (Heh-heh.)

Continued from page 53

Sprite Animator screen display prompts with a Load MASTER Disk, but the program is on the PICTURE Disk. Koala pad is placed in port 1, not port 2 as stated in the manual.

When using the Koala pad the two upper buttons are not equal. For example, each button does different things when setting a starting point. Also, when using the Koala Pad to enter the expanded or special font modes, you almost need three hands—one to hold down the SHIFT key, one to hold the stylus on the menu position, and one to hit the Koala Pad data entry buttons. It reminded me of the story of Mozart's request to play three notes simultaneously on the piano—one in the middle of the keyboard, and one on each end of the keyboard. Mozart did it by using his head (actually his nose).

Expand the System

One of the most important reasons for using the *Flexidraw* software is that it is directly compatible with the following outstanding productivity systems: Computer-Eyes, *Print Shop* (in the Screen Magic mode), *Movie Maker, Bannermaker, Billboard Maker, Icon Factory.* Also all eight of the Inkwell *Graphics Galleria* disks provide hundreds of clip art pieces directly compatible with *Flexidraw.* And if you use the Inkwell Graphics Integrator 2, you will expand your productivity universe to include *CADPAK 64, Animation Station, Newsroom,* GEOS, *Super Sketch, Blazing Paddles, Doodle, Print Master* and the Koala Pad files.

> To say that this is a well-thought-out system that provides a unique productivity tool, is to say the least.

To say that this is a well-thought-out system that provides a unique productivity tool, is to say the least. Inkwell Systems—in all aspects—is a user-oriented company. In fact, even though the Koala Pad has been discontinued for some time, it is impressive to note that they continue to consider users who still use this drawing tablet.

Recommendations

The unlimited capabilities of the software make it a productivity tool that surely rivals similar pieces of software. For the price, the packed, two-sided disk is an outstanding bargain.

And as far as the hardware goes, I recommend the light pen as the optimum input device. The joystick does not give as much flexibility as either the light pen or the Koala Pad. I met with some difficulty drawing free-hand curved lines with a joystick. And use of the Koala Pad resulted in some unacceptable, spurious marks in the work area, that we think was due to the sensitivity of the Koala Pad itself.

No such problems resulted with the light pen. The ease and flexibility of use of the light pen and the ability of the light pen to create exacting artwork make it an excellent buy. The choice of a light pen, nose-pressed switch (model 170-C), or a finger-pressed data entry switch (model 184-C) is yours. The advantages or disadvantages of either design is obvious.

Therefore, after evaluating both the software and the three input devices—the light pen, the Koala Pad and the joystick —I more than highly recommend both the *Flexidraw* software and the light pen. There is no question in my mind—you won't be disappointed. Furthermore, you will have a system that you can build on. C

Continued from page 44

Two rounds are fired at you from the alien, catching you offguard. Your body is knocked back some distance due to the impact. Luckily, your shield absorbed the shots, and now it's your turn. As you stand up, you brace yourself as you fire your blaster. Bull's-eye! the shot disintegrated the alien! Just then, you notice what the alien was trying to protect—the shuttle component. Now all you have to do is find the other components and make it out alive.

Summary

I wish to compliment Psygnosis Software for implementing some extra features in this game. The music and save options were truly an added plus, which made for much better game play. The manual is very complete and gives great detail on all game controls. Like some other titles from their company, control is done through the use of icons at the bottom of the screen. I noticed that the problems with delayed mouse routines were gone, which helped tremendously. I also liked the pause feature, which helps if you need to take a break. At any time during game play, you can press the HELP key for special game options. These options are: Load a Saved Game, Music off, Music on and Restore Game.

The animated sequences are something that must be seen to be appreciated. As always with Psygnosis Software, you will find an animated sequence at the beginning of the game, along with a poster from the cover of the game box. This sequence is a close-up of Drak, firing a blaster and is perhaps the best game introduction I have ever seen. The beautiful scrolling screens in the game appear in 3D. *Obliterator* will make you feel as if you are a part of the game, and will capture you from the moment you start playing. The graphics are stunning, the music is rich, and the game play is awesome!

Hints for Survival

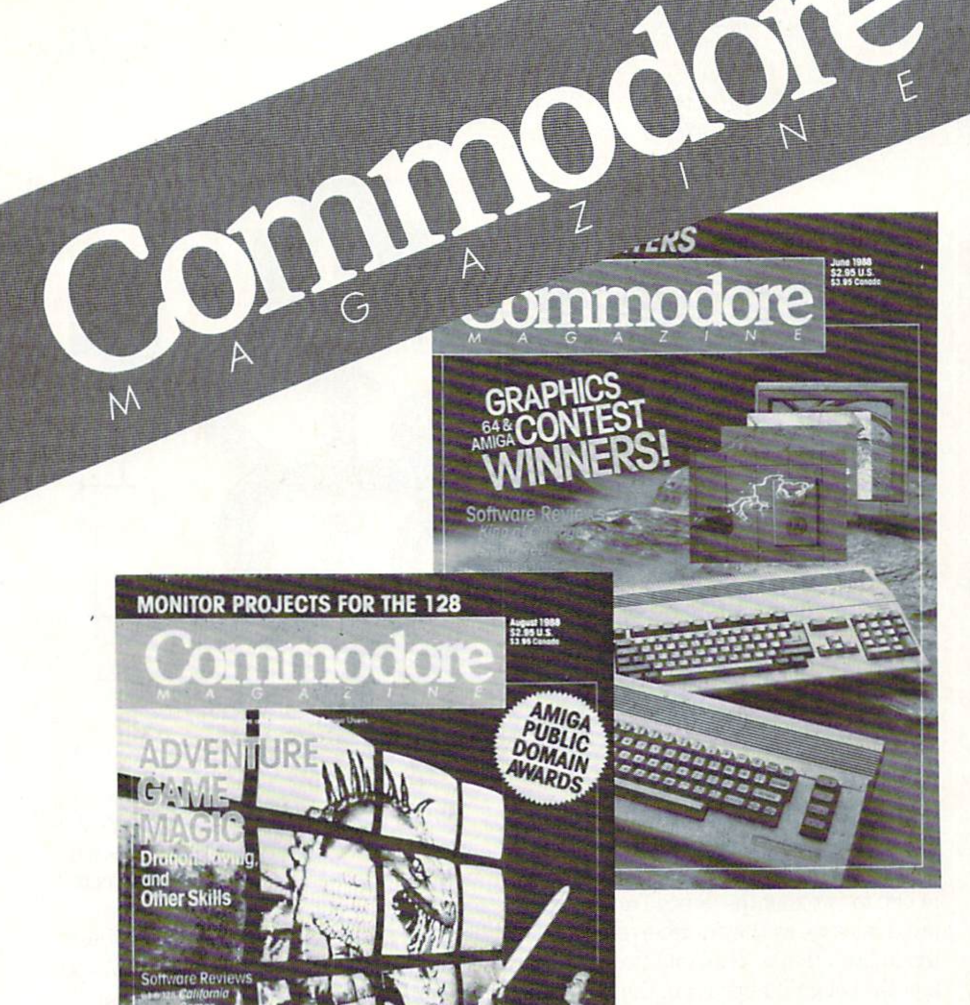
During game play, learn to listen for faint hums in the background. This generally indicates that a motion sensor has detected you, and booby traps have been activated. The best way to avoid a trap is to use the "Defend" option when walking in the direction you are going. In most cases, the lasers will pass over you. However, there are several traps that will nail you no matter what you try.

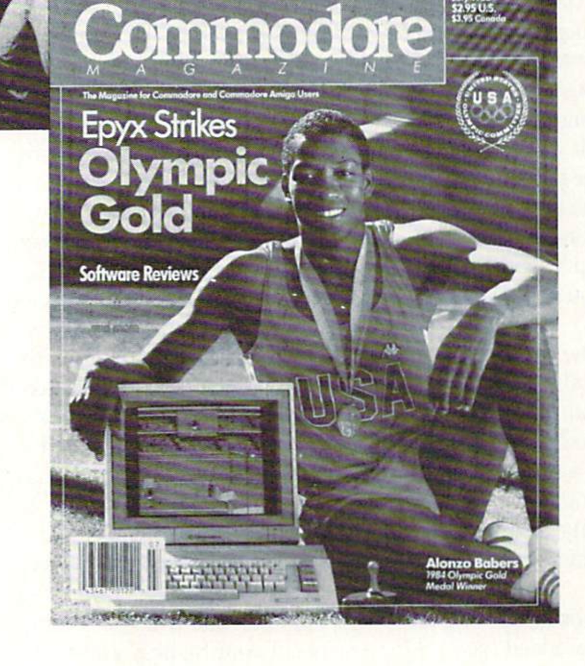
When you encounter an alien hanging from the ceiling, use your pistol instead of another weapon. Your pistol tends to aim higher than other weapons and will hit the alien. The only problem is that there is about a 40% chances of it killing your enemy. Also, be careful not to get to close to them. Some types of aliens, will hang on to you while attacking.

The time to use your special weapons is when your foe doesn't respond to being hit. This is a good indication that you should bring out something more destructive. A good time to do so is before you have an encounter with your opponent. If you cannot switch weapons in time, be prepared to take some hits.

Never, under any circumstances use your Laser Bazooka on regular enemies. This is the most powerful weapon you will find during the game. The main reason for not using this weapon is because you will need it for other occasions (I don't want to spoil any surprises).

After you find either a special weapon or a component, try to locate a shield-regenerator. This will enable you to continue game play with your exact status if you get killed. C

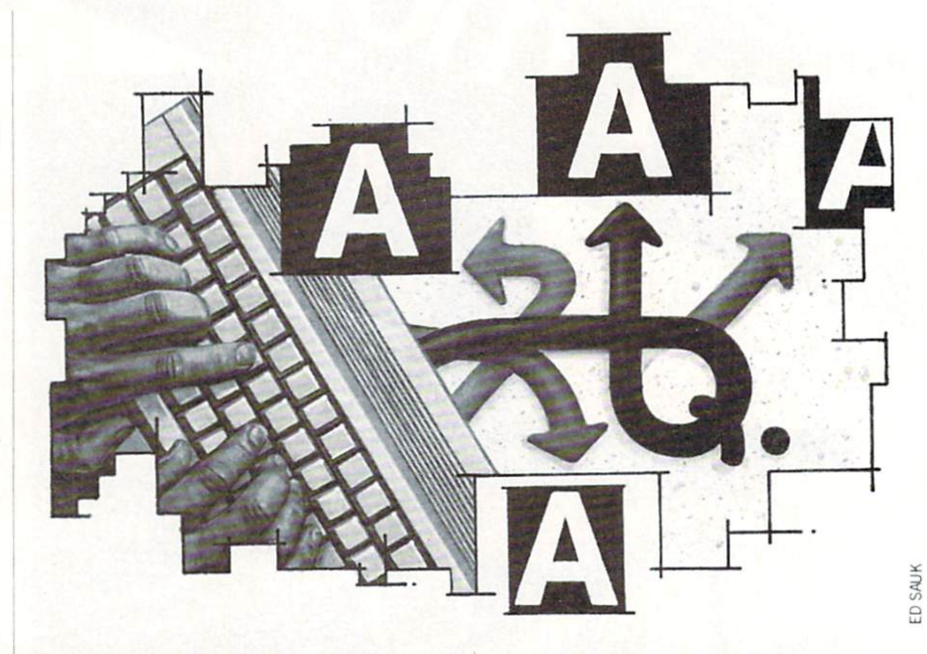

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June 1988
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$3.95 Canada
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Medal Winner

by Robert W. Baker

Online Product Information

Explore the inner workings of the Q-Link telecommunications service with network pro Bob Baker.



ED SAUK

If you're looking for information before purchasing new products or need help after buying a product, you'll find a number of areas on Q-Link that can provide the information you need. Probably the best place to start is in the Software Showcase. Here you'll find all sorts of information on new and recent releases plus occasional online trade shows and other special events.

The Software Buyer's Guide provides downloadable preview copies of various products as well as an easy and convenient way to order the products via Q-Link. Complete instructions on how to order are included in the Previews section along with a list of the participating publishers.

If you want more information from other users on how good (or bad) a product might be, check out the Reviews section of the Software Buyer's Guide. Here Bob Lindstrom provides his comments and ratings of recent products for the Commodore 64, 128 and even the Amiga.

There's also a special message board in this area where anyone can post his own personal comments or questions on any Commodore-related product. If you've noticed a problem in a particular product, or have a real favorite, this is the perfect place to share your thoughts and experiences. Don't be afraid to jump in and comment on anything that you can help with.

I manage another area of the Software Showcase Buyer's Guide that also appears in the Commodore Information Network's News and Reference area. The New Product Information area provides a number of text and message boards with the latest information on new and coming products, product updates and general industry news.

This area was restructured over the summer with online text areas added specifically for press releases. I'm posting press releases received from numerous companies throughout the industry on a daily basis (generally 24 to 48 hours after they are received). They were previously posted within the standard message boards and were deleted from the system in one to two months. Since I'm posting press releases as they're received, much of the information is available two to three months before it appears in the consumer magazines. As text files the major announcements can be kept around a little while longer for future reference.

Besides the product information, I also post overviews of most of the popular Commodore-related magazines each month. This gives you a convenient place to check what's going on in some of the publications you might not normally receive.

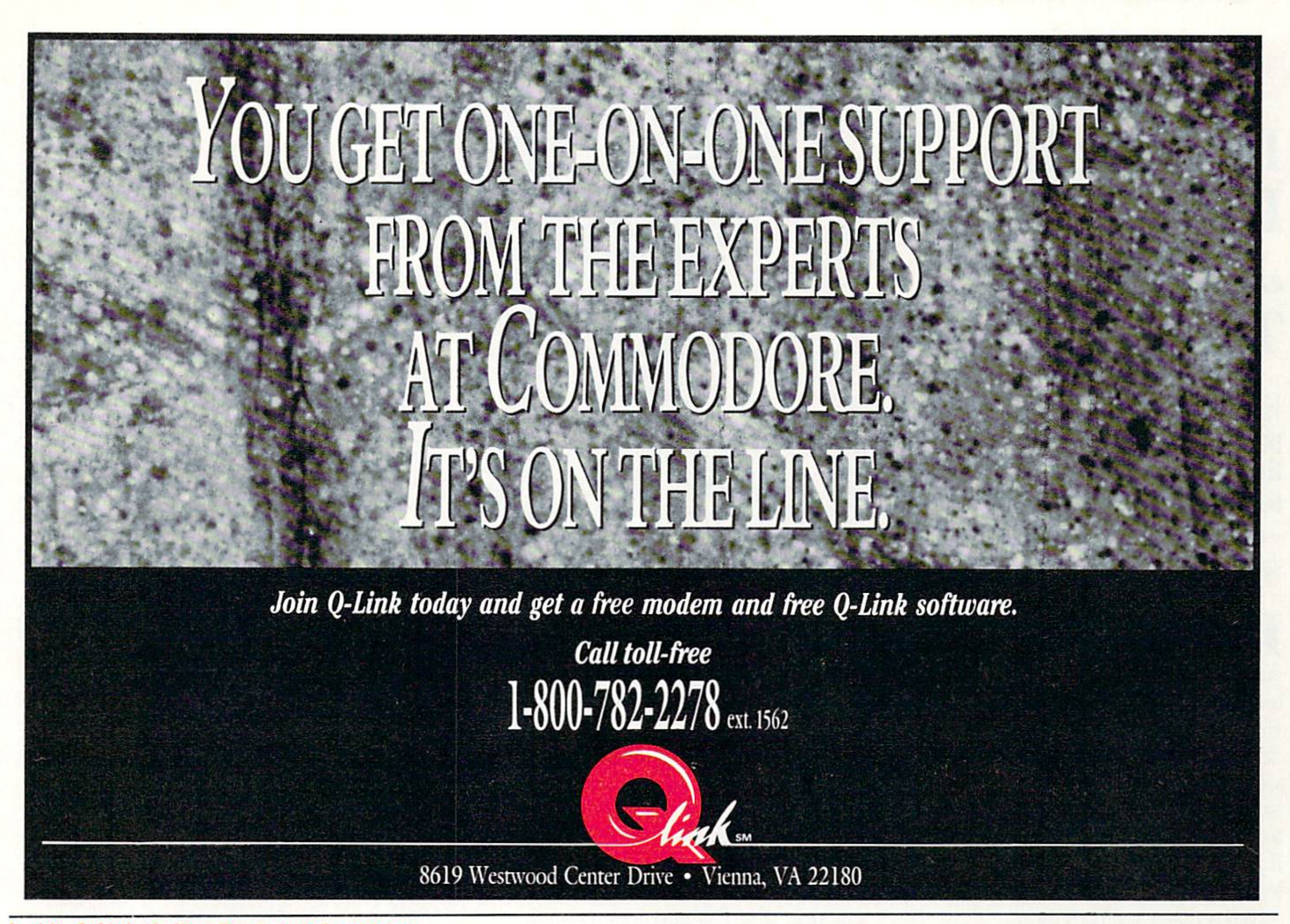
Another area was added to the New Product Information section to cover home video game systems like those from Nintendo and Sega. Quite a few people have asked for news on products for these systems, so now there's an area specifically for this information. If you're interested in these systems, now you won't have to sort through the various computer-related messages to find out the latest information on new titles, accessories, etc.

The video game section has separate text areas for each machine plus message boards for questions and general information, sharing hints and tricks, or even bragging about your highest scores (on your honor, please!). There's even a download area where you'll find archives of older information, product indexes and other useful information.

While on the subject of the download libraries, each area in the New Product Information section has its own download library. Here you'll find various demos, product catalogs and indexes, plus other useful product-related information. As for Amiga demos, most of these are actually much too big to provide online, so I have to handle those by mail until we can find a better way to distribut them. You'll find a list of available demos plus information on how to obtain copies in the Amiga section of New Product Information.

By the way, I also maintain (off line) several databases with information on over 2200 companies and over 7000 products or services they offer for Commodore systems. If you need the mailing address or telephone number for a certain company or information on a hard-to-find product, I can generally help. Just post your request in one of the message boards in the New Product Information section, and I'll check my database to provide whatever information I can find. Some day we hope to find an easy way to provide this mountain of product information online.

The remaining section of the Software Buyer's Guide is the software ordering area where you can use the MENU Software Finder service to locate or purchase those hard-to-find products. You can also order products from selected companies (like GEOS products from Berkeley Softworks). Earlier this summer, Omnitronix had a customer support area there



Inside Q-Link/Online Product Information

too, where you could order products or get assistance.

Actually there's an entire area just for customer support from the larger software publishers. The Software Support Center provides easy access to companies like Abacus, Activision, Broderbund, Datasoft, Electronic Arts, Epyx, Rainbird, Micro-Prose, Timeworks and others. Each company available online has its own area, so the information and services they each provide will vary. You'll find new product announcements, upgrade information, hints and tips, support utilities and more. Plus there is generally a customer service message board in each area where you can ask questions or make comments and suggestions.

Most of the companies now have personnel who manage this area on a regular basis. However, there may be times when they are not able to get to a particular question right away. Keep in mind that it might take a few days for them to get an answer from the appropriate person within their company. Also, they're generally online during the day when network use is heaviest and when Q-Link is doing their development and maintenance work. So please be patient and give them a chance; the companies would not have made the commitment to provide an online support area if they were not going to be there to help you.

For GEOS users, Berkeley Softworks has their own expanded support area in the Software Showcase. They provide programming information, software libraries, news and information on new products, forum transcripts, customer service messages, and even a laser printing service accessible via Q-Link. If you're using GEOS and haven't visited this area of Q-Link yet, you're really missing out on a wealth of information.

The Software Showcase also includes the Public Domain Libraries also accessible from the Commodore Information Network. Plus there are a number of Special Edition software libraries where you'll find special programs from Jim Butterfield, Louis Sander, Lou Wallace and myself. Many of these programs have appeared in various magazines and are available here with special permission from each publisher. Many of these programs *are not in the public domain*, but are available to Q-Link subscribers as a special service.

Besides the various areas of the Software Showcase, you may also want to check out support areas in the Commodore Information Network. Here you can usually find hints and answers to problems you're having with existing products, or help with creating your own programs. The various Sysops will try their best to help, and can generally point you in the right direction even if they cannot give you a specific answer.

All in all, Q-Link has a lot to offer in the way of product information and support, in addition to a wide user base of "experts" all eager to help fellow users. Just remember that this is a give-and-take situation—the more people who actively participate, the better the flow of information. Participate whenever and wherever you can.

Before closing for the month, my thanks to Ol' Catfish for his previously-mentioned hint for using *Partner 64* for printing saved messages from Q-Link. When I mentioned the tip several months ago I couldn't remember where it had come from. So thanks again!

As always, I can be reached almost daily via E-Mail to RBAKER if you have any comments or questions concerning this column or my area on Q-Link. Also, if you would like to contribute something for this column, please let me know. ■

by Mark Jordan

Drum-roll, Please: Jordan's Top Ten

Explore the Commodore 128 in its powerful native mode. Some of the articles in this column may be technical, some not so technical —but we guarantee that they will spark your creativity.

Have you ever fallen in love with a tool? If you're a mechanic perhaps you have a special feeling about your socket set. (Open-end wrenches are my favorite.) Wood workers and carpenters among us may warm at the thought of a steel tape, or maybe a power miter box. It isn't necessarily the most powerful or hi-tech tool that we feel most strongly about. It is often the tool that we used when learning the trade or the tool that first solved a major problem for us.

Over the years I've developed a special feeling for certain BASIC 7.0 tools. Some of my favorite—good ol' PRINT, for example—are quite common and are found in most versions of BASIC. Others, like DO/LOOP, are not available for 64 programmers but are available on many other computers. Still others, like SPRDEF and RSPPOS, are unique to the Commodore 128. Since this is Computer Learning Month, I thought I'd educate you with my top ten BASIC 7.0 statements. These have been chosen not based on frequency of use—if I did it that way then certainly PRINT would win. Neither have they been chosen because they are the most obscure commands. They are simply my favorite statements that solve programming problems for me better than any others.

First, an explanation of terms. I use the words "statement" and "command" interchangeably. According to the Commodore glossary, a command is an instruction used only in direct mode while a statement is simply any instruction. Since I learned programming on the streets, my terminology may offend you pros out there. Bear with me.

So here they are, my Top Ten BASIC Statements/Commands. These are the ten



ART BAXTER

that every 128 owner should learn to know and love. I hope my list, with the explanations and examples included, inspire you to get acquainted with these fellows.

1. INSTR: I love this statement for three reasons. One, it allows me to search through strings for certain characters much more efficiently than with the MID$ statement. Two, INSTR lets me predefine strings of characters which can be used to accept only certain key presses from users. And three, by arranging those predefined strings strategically, I can then use the ON/GOSUB statement to do things really fast.

Let's take a look at how to do each of the above.

a. Search Strings: When I wrote a word processor in BASIC ("BrainPower") I wanted a search and replace feature, naturally. The program was designed so that every line on the screen that the user typed would become a string in an array: A$(xx). In other words, the first line the user typed would be held in the variable A$(0). When the user wanted to search for a word or phrase, the word he was searching for would be held in a variable such as SEARCH$ (or SE$).

Here's how easy INSTR made it to perform the search:

```
1000 FOR T=0 TO D: rem D is the last
    line the user has typed.
1010 P=INSTR (A$(T),SE$): rem P
    will point to the first character of a
    match. If P=0, no match.
1020 IF P>0 THEN GOSUB xxx: rem
    found a match so deal with it.
1030 NEXT
```

b. Limiting Strings: Within this word processor I created a small calculator subroutine. When in this routine I needed to check what keys the user pressed and act accordingly. Besides the number keys, only about five others were needed. To prevent the user from pressing irrelevant keys and having the program do crazy things, I simply predefined a string variable of all the allowable keys. Like this:

```
NU$="0123456789.–+*/"
```

Here's how the routine used this variable:

```
2000 GETKEY A$:P=INSTR
(NU$,A$): IF P=0 THEN 2000
```

As soon as a key is pressed it becomes variable A$. Then the INSTR statement checks NU$ to see if any A$'s are present. If there are none P = 0 and we go back and do it again.

c. In Conjunction with ON/GOSUB: To use INSTR to speed things up, once a legitimate key has been pressed—let's say the user presses the asterisk key (*) in order to multiply. In our example here, asterisk is the fourteenth character in NU$. When the user types an asterisk, P = 14.

Here's how that information is put to use:

```
2010 ON P GOSUB xx,xx,xx,xx,xx,xx,
xx,xx,xx,xx,xx,xx,xx,3000,xx
```

For clarity's sake I used xx's to denote other lines. It's the fourteenth item in the list that counts, and that's where the asterisk subroutine must be.

(By the way, ON/GOSUB didn't make my top ten, but it's got to be eleventh or something. Learn this command if you haven't already. It's a real program-accelerator.)

2. CHAR. Don't underestimate the uses of CHAR. I have found it to be far more versatile than PRINT and usually faster, too. It works in 80-column mode too. For the most part, I use CHAR like other BASIC's allow PRINT AT. For example, if I want to print something at column 20, row 10, I simply type: CHAR ,20,10,"Text". You'll note that I did not use a number between the keyword CHAR and the first comma. It's optional to do so (0 prints in the background color, 1 in the foreground).

CHAR works great in a drop-down menu. Suppose you want a menu to hang from the upper left of your screen in the following manner:

```
FILE ________________
PRINT________________
SAVE ________________
EXIT_________________
```

Put the four items in an array:

```
M$(0)="FILE":M$(1)="PRINT":
M$(2)="SAVE":M$(3)="EXIT"
```

Now as the user moves his mouse, joystick or cursor keys up and down this menu, you simply need to calculate where he is and convert it to a 0, 1, 2 or 3 then use that information to toggle the respective item on or off.

Here's a sample for use with cursor up/down. Three variables are important here: M$(x) equals the items in the menu, M equals what item the user has just selected, and OM equals the former item the user selected. This routine assumes the user is already at the top item (M = 0):

```
100 DO:GETKEY A$
110 IF A$=CHR$(13) THEN EXIT:
    rem if RETURN was pressed we're
    done
120 IF A$="<up>" THEN
    M=M+1:IF M>3 THEN M=3
130 IF A$="<down>" THEN M=
    M-1: IF M<0 THEN M=0
140 CHAR ,0,OM,M$(OM),0: rem the
    trailing ,0 shuts off reverse mode on
    old item (OM)
150 CHAR ,0, M,M$(M) ,1: rem the
    trailing ,1 prints in reverse chars on
    new item (M)
160 OM=M: rem set OM to M to pre-
    pare for next time through the loop
170 LOOP
```

See how slick that is. You can use CHAR for most of your printing tasks, but keep these limitations in mind:

- if you ever want to redirect output to a printer, forget it;
- you can't include a HOME command inside the string or your PRINT AT capabilities are lost;
- there was a bug in the original operating system that transposed characters within a CHAR string if your program was long enough (we're talking 40K or so);
- to add strings together you must include a plus (+) sign. Like this: CHAR ,10,10,M$+"Hello"+A$.

3. SPRSAV: I have several reasons why this one is rated so high on my list. First and foremost, you can now save hundreds of sprite shapes into arrays and grab them back with complete ease. Animation has never been easier. Say you have 16 sprite shapes you've designed and saved to disk in two separate files. And say you want to cycle one single sprite through all 16 of these to create an animation. To do this you must load in your first set of sprite shapes like so:

```
BLOAD "SPRITE SHAPES 1"
```

Then you must put each sprite into an array:

```
FOR T=1 TO 8:SPRSAV T,AR$(T)
:NEXT
```

Now get the next bunch of sprites:

```
BLOAD "SPRITE SHAPES 2"
```

And continue saving them into your array:

```
FOR T=1 TO 8:SPRSAV T,AR$ (T+8):
NEXT
```

Now whenever you want to animate a sprite, simply use SPRSAV in reverse:

```
FOR T=1 TO 16:SPRSAV AR$(T) ,1:
NEXT
```

This will cycle sprite 1 through all 16 shapes. Of course, if you do that last line without placing a slowdown loop before the NEXT, it'll happen too fast.

Another excellent use of SPRSAV is to "print" a sprite to a bitmapped screen. You can design one sprite as a tree or something, then SPRSAV it to a variable,

then GSHAPE it all over the place. Of course, you must be in bitmapped graphics mode for it to work. Here's how:

SPRSAV 1,TR$:GSHAPE TR$,100,200: and so on.

4. DIRECTORY: Having been weaned on the Commodore 64, the inclusion of this statement into BASIC 7.0 made me feel like a hockey player leaving the penalty box: free at last and looking for revenge. I use this statement mostly in the direct mode because (if you've been following my column you know this) I've written my own directory routine in machine language that allows me to put items in an array. This is DIRECTORY's one shortcoming: there is no way to convert the items into variables that you can deal with.

It's "longcomings" include the use of selective directories and the ability to tie it in with the KEY command to get a one-touch directory listing. My advice: when working on a program, give each updated version the same first two letters, such as "NC." Then use DIRECTORY "NC*" to list only those items.

5. KEY: User-definable function keys make life worth living. (This is written in a holy book somewhere.) I know all 128 users use the KEY command to some extent, but I wonder if you all exploit it? My exploitation consists of:

a. Saving my favorite KEY definitions to disk and loading them every time I fire up to program;

b. Defining one key (my choice is F2) to do the following: move the cursor to the end of the line it is on, then erase everything below on the screen. I do this by typing:

```
KEY 2,CHR$(27)+"K"
+CHR$(27)+"@ ";
```

c. Defining one key (F3) to first clear the screen, then list a selective directory as described above. Like so:

```
KEY 3,"<CLR/HOME>DIRECTORY"
+CHR$(34)+"NC*"
+CHR$(34)+CHR$(13)
```

d. When converting sprite data to DATA statements, I first use the monitor to list the data: MONITOR:M0E00 0E40. Then I exit the monitor (press X then RETURN). Next I define one key like this:

```
KEY1,"--,--,--,--,--,--,--,--,,"+
CHR$(27)+"Q"+CHR$(141)
```

The dashes above (--) translate to cursor-rights. Next I move my cursor to the first line of data left over from monitor listing and press F1 eight times. All garbage characters will disappear and commas will be neatly in place between data items. Finally, I go to the beginning of each line and type an appropriate line number for each (remembering to press RETURN each time) and I've got my data statements. It takes about a minute.

6. WINDOW: I first experimented with windows on a Commodore B128. I was disappointed. Since the WINDOW statement couldn't preserve the contents of the screen then replace them after a window had been printed, I figured this command was a novelty only. When I got my Commodore 128 I discovered the statement was basically the same, so I temporarily forgot about it.

Well, if you've been with this column for the past year, you may recall an article I wrote with a program that will preserve the 80-column screen and retrieve it as quick as a flash. That program gave birth to several other programs which made use of windows extensively ("Story-Writer," "Window-Mania").

I mainly use it in program mode to do things like print a menu on the screen, put some Help info somewhere on the screen, or lay out the entire screen into informational zones. But I also have found that this command is handy in direct mode. For example, if I want to see all the items on a real long directory, I'll clear the screen, list the directory until it almost gets to the bottom of the screen, press RUN/STOP, go back to the HOME position, press TAB three times, press ESCAPE T, then list the directory again. What it does is to create two columns (more can be done the same way). I also do this when I'm using the machine language monitor and I want to see more than just 25 lines of disassembly.

WINDOW does have a quirk. Immediately after issuing a WINDOW statement, do not begin the next PRINT statement with a HOME or your window will be lost.

7. DO/LOOP: This statement family (including WHILE, UNTIL and EXIT) is a favorite of mine not because it does anything I couldn't already accomplish with more primitive BASIC commands, but because it does it more elegantly. I almost said "with better structure" but I didn't want to burn any of you out there who hate the very words "Structured Programming."

I kind of hate those words myself. I always start programming simply by slashing away at things (remember, I'm a "street" programmer). But at some point I find that I need to clean things up and make them easier on the left side of my brain. DO/LOOP structures do that for me. If you look at the first item in this article, INSTR, you'll see a perfect example of how I like to use them.

8. RENUMBER: There is just one simple reason I like this command: it neatens things up. I am not known as Mr. Neat in my real life. But when I get behind the keyboard, look out. One tip: when you've been working with a program for a long time, you'll get to know certain routines by their numbers. If you really feel you must renumber, put in a line like this at the top of your program prior to renumbering:

```
0 ON P GOTO xxx,xxx,xxx,xxx,
xxx,xxx,xxx,xxx
```

Make the xxx's the starting line numbers of the routines you'll want to find later. After renumbering, check out your first line to see where the new locations are.

9. SPRDEF: I've mentioned this one so often in previous columns I hate to bring the topic up again. But I must. This one command being built-in is what puts the Commodore 128 ahead of every other PC on the market when it comes to designing games and graphics. And you can even use it within a program (see "SPRDEF-Plus" in the July 1988 issue).

10. All the drawing commands (DRAW, CIRCLE, BOX, etc.): Again, having been raised on BASIC 2.0, I have more appreciation of the finer things in life on a 128. If I may use another simile, I feel like a Russian defector to the U.S.—appreciative of the little things, like food, shelter, and remote-controlled TV. I would also include SSHAPE and GSHAPE here because these two oxen can plow bitmapped screens littered with sprites. Or something like that.

Well, that's it. My top ten. You will likely be mad that one of your favorites is off the list. But when you get right down to it, BASIC 7.0 is so rich, so versatile, that it's hard not to include all 164 of them. As I look at the list on page 341 of my User's Guide, I am moved to re-state what Will Rogers once said: "I never saw a BASIC statement I didn't like."

Wait. I take that back. I hate LET. Any self-respecting "street" programmer has to. It's like saying "Please." And I'm way too tough for that.

I gotta go. ■

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The Commodore Connection.

...sort algorithm.

...it would not fit. Here's a problem that's as simple as Mother Goose for ...word? I suspect the wards are full of people who tried, reached

ENTERTAINING COURSEWARE

Crossword Magic

Crossword Magic creates crossword puzzles. It interweaves teacher/parent-supplied words into checkered numbered squares exactly like the professionaly-created puzzles appearing in daily newspapers.

Basically, *Crossword Magic* is a cleverly camouflaged fill-in-the-blanks exercise. Since the words and their related clues determine the level of complexity, *Crossword Magic* is smoothly assimilated into the curriculum. Words can be from one to twenty characters long.

The initial work screen following the eight-choice main menu displays a small blank crossword. Users consecutively key in the answer words they want inserted. The program shuffles and slides these words into the puzzle vertically or horizontally, crisscrossing like letters where appropriate. Simple commands allow editing, relocating and deletions.

The puzzle's size, at the user's option, expands to incorporate the words. Words that cannot physically fit or interlace are held in a buffer until needed or discarded. Since the matrix is totally flexible, words are easily linked to a child's learning level and interests.

One or more letters of an answer can be left in the puzzle providing a hint for players contending with especially thorny solutions. Words may be manually entered into the puzzle by overriding the automatic placement feature.

When all the answer words are entered, each is highlighted as the program asks for the word's related clue.

Although a puzzle can be played on screen, it's simpler in printed form. The print menu offers numerous options including printing just the puzzle, a puzzle with its clues as well as a solved puzzle. The answers can be printed separately as an out-of-context list. Printout time is directly related to the speed of the user's dot matrix printer. The program supports eighteen printers and seven interfaces. Once selected, the configuration is permanent.

At all times a full range of options and commands remains accessible via the F1 key. These include saving a game or finished puzzle, editing (both answers and clues), playing, viewing answers, relocating



Crossword Magic

Astro Grover

Continued on page 124



...RNING MONTH

by Howard Millman

Maxi Guides to Micro Software

Educational software, like most other things, ranges from sorrowful to superb. Our bi-monthly column of educational software sifts through the buzzard's nest of vendors' promotions and promises to deliver objective detailed reports on the best of the bunch.

Here we introduce two additional reference sources that annually publish program reviews and descriptions.

Early Childhood Software

The High/Scope Foundation, a not-for-profit educational foundation,

Continued on page 124

The Quintessential Software Directory

R. R. Bowker's *Software for Schools 1987-88* describes 8800 K-12 educational packages in their comprehensive digest.

Its 1100 pages are divided into five main sections; the largest is the software by title section. The index lists programs alphabetically along with its publisher, release date, computer brand, suggested grade level and a concise straightforward description.

Another handy section is the Classroom Software/Grade Level indexes. Here, software is arranged by content. Each of its 80 content areas is subdivided into five grade clusters spanning the K-12 range. Subject headings include language arts, foreign languages, mathematics, social sciences and others.

After locating the software in either or both of the two preceding regions the researcher next rummages in the Publisher's Index where the 900 publishers of the foregoing programs are listed. In addition to name and address this section includes toll and (when available) toll-free phone numbers.

The directory's other sections are comparatively minor in size but not in function. They include a Periodicals Directory enumerating 125 magazines and newsletters of interest to educators, a Glossary, and a special section of Professional Software for use by teachers, administrators and other professionals. We now have some 65 software packages on our shelves submitted for review.

Continued on page 124

COMPUTER LEARNING MONTH INTERVIEW:

Dr. Ken Brumbaugh



Ken's charted a course guided by both the beacon in the lighthouse and its heat; he's determined to see Commodore reach its destination.

This September Commodore began their campaign to reinforce their success in the educational computer market. The key elements in their arsenal includes special promotions for the Amiga 500, expanded support for MS DOS machines (Commodore PC 10 and the Colt) as well as continued corporate advocacy of the Commodore 64 and 128.

I spoke with Ken Brumbaugh, past president and CEO of the Minnesota Educational Computing Corporation (MECC), the consortium founded in 1973 to develop and monitor the employment of computers in Minnesota classrooms. Ken rejoined MECC in 1974, just after receiving his Phd in Science Education from Wayne State University in Detroit, Michigan.

Ken, in private practice since 1986, is Commodore's coordinator and consultant and a key resource in their commitment to reinforcing CBM's presence in the educational computer market.

Howard Millman: Just so we're all talking apples and apples (maybe we shouldn't use exactly that analogy), in your pivotal position as trail guide, coach and conductor what are your primary responsibilities?

Dr. Ken Brumbaugh: It's to be responsible for growing the Commodore educational software collection, working with developers/producers, putting together computer workshops, and developing special promotions for schools and educators.

Beyond that my overall thrust is to increase the market acceptance and penetration of the Amiga and MS DOS machines while concurrently stressing the value of the Commodore 64 and 128.

Two of the ways we intend to accomplish these goals are first, by maintaining communication with Commodore's educational software developers to increase the amounts and types of quality software for schools and educators. Second, to assist in the planning and implementation of marketing K-12 educational hardware for all Commodore computers.

Millman: That's fine for the satellite view; specifically, how do you propose to achieve these goals?

Brumbaugh: Commencing this September we intend to establish the Amiga as the standard computer for educators. Among other things we're bundling utility software with the Amiga specifically geared for use by educators. Music and graphics software, for instance, along with productivity tools including desktop publishing, grade reporting, video/text titling for desktop presentation are some of the areas covered by the promotion. These programs will be provided to all educators who purchase an Amiga 500 system. We also intend to become a major supplier of MS DOS computers to schools and to maintain and expand the Commodore line of products in schools.

These are our current goals; we're prepared to modify them as well as implement new ones as our strategy continues to develop and mature.

Millman: These sound like long-range goals, how about the near term? How do you intend to implement your current strategies?

Brumbaugh: We've developed a clear sense of purpose and direction. These include:

- Establishing a strong, viable Commodore educational dealer network.
- Focusing on the needs of user groups for each machine of the Commodore hardware family.
- Assisting educational software developers by communicating our needs, priorities and plans as well as helping them with various marketing promotions.
- Establishing and maintaining communication with the educational community so that their needs are met and concurrently confirming that Commodore's plans and promotions are on target.

Millman: As a result of Commodore's increased emphasis on serving the educator and student, will a greater number of students become more computer literate or enjoy greater computer literacy than they do now?

Brumbaugh: I'm uncomfortable with the term ''computer literate.'' It's somewhat exclusionary. I think that all students in our society

Continued on page 125

Profile:

MARGARET MORABITO

If Margaret Morabito's energy could be tapped, it would power a small city.

Margaret, operating out of her Rindge, New Hampshire headquarters presides over two of Q-Link's services, Community College and the Tutoring Center; she writes professionally and also directs the Computer Assisted Learning Center (CALC).

Six years ago, Master of Education degree in hand, Margaret set out to expand the role of computers in education. With a diverse background as a college English instructor, director of a U.S. Army computer center and an instructor of English for the Navy, she's well qualified for the task.

In January 1988 she organized CALC to assist and encourage teachers and parents to more effectively use the Commodore 64 and 128 computers in a formal or home learning environment. Margaret clarifies CALC's purpose as expanding the use of computers "not merely to further computer literacy but to enhance their use in education." Margaret's conduit for getting the word out is CALC's newsletter. Each 12-page issue contains features, letters, subscriber questions and answers as well as reviews of commercial educational software.

Additionally, public domain and shareware software is available directly from CALC at $10 per disk. Each double-sided disk contains between 20 to 100 prescreened programs. One of the more exceptional collections of programs resides on side two of disk #6. Its focus is on helping handicapped students transcend their disabilities while supplementing more traditional educational opportunities.

Education Online

The Tutoring Center Margaret directs for Q-Link features real-time interaction between students and teachers. Instructors, available in various subjects, hold hour-long classes for students of all ages who require remediation or just a bit of help over the rough spots. Between sessions, students leave their questions on the department's bulletin board.

Q-Link's Community College is more formal. This semester it's offering 35 diverse classes ranging from Mythology to Math to Medical Malpractice. Students formally register for each course and are expected to attend each regularly-scheduled class. In the future Margaret hopes to issue college-level credits to students who successfully complete each course. She has already started on the long road to receiving accreditation.

Margaret sees the computer as an underutilized implement. "If any one tool exists that parents and teachers can use to help children, *all* children, from grade school through college, or adult learners, the computer is that tool." And that help is sorely needed. A recently released study, the National Assessment of Educational Progress revealed that most children had difficulty with computer applications and programs. Only twenty to thirty percent of computer-related questions asked in a nationwide random sampling of third, seventh and eleventh graders were answered correctly.

Not willing to ignore the needs of teachers or parents who share her enthusiasm of computers in education, Margaret has recently expanded CALC to include coverage and programs for the Amiga and Commodore PC-10 (MS DOS). She requests that anyone willing to donate public domain educational software for either of these computers as well as the Commodore 64 and 128, submit them to CALC for national distribution.

Margaret and her dedicated nationwide staff have completed the first steps of a long journey, they deserve the success they've achieved through their diligent efforts. For Margaret the end is not yet in sight with her many years of experience in education she well knows that some seeds take longer to bloom than others.


DEBORAH PORTER-HAYES

Six years ago, Master of Education degree in hand, Margaret set out to expand the role of computers in education.

CALC
P.O. Box 132
Rindge, NH 03461
Individual subscription $25.00 (11 issues)
School and overseas subscription $49.00 (11 issues)

It was Valentine's Day 1988, and the chess world was in love. They had just experienced a first. World Chess Champion Gary Kasparov had just simultaneously played ten opponents. Amazingly, his opponents were seated in ten different countries—Australia, Senegal, Switzerland, Belgium, Japan, Italy, Canada, England, the Soviet Union and the United States.



This 3D view in *Chessmaster 2000* is one of the most spectacular graphics of any computer chess game. Even in this mode, the board can be rotated 90 degrees for a better view of the board.

Yet today anyone with a Commodore computer, the right software and a local telephone number can emulate that feat on an existing and growing worldwide chess computer network. Use of this network is growing because of the excitement generated by the chess community and support from the United States Chess Federation (USCF).

Computer Chess Takes Hold

Before we get into details of this network, it is best to set the stage by describing the software that allows a more local learning and playing of chess. Modern computer chess began in 1949, when Dr. Claude E. Shannon of Bell Labs programmed an electronic computer to play chess. Throughout the ensuing years, programmers consistently endeavored to use each newly-designed machine to play chess faster and more accurately. In 1970 the first U.S. Computer Chess Championships were held and have continued ever since. More recently, the first World Computer Olympiad was held in London, with computerized chess programs competing against one another on their particular machines.

Microcomputer development offered no less of a challenge to astute programmers. What resulted were chess tutorials, games and networking software that have taken on a life of their own. Whereas many software games and programs become outdated with improved programming, quality chess software—like chess itself—has developed staying power. Even after years on the market, chess software is finding new life.

Today's predominant microcomputer chess software can be grouped into four major categories: (1) tutorial software that uses a single microcomputer; (2) game-playing software that allows individuals to play with another human or against a single microcomputer; (3) chess telecommunications software that allows two players to play chess between their individual microcomputers; and (4) network telecommunications software that enables players to access and play, learn or watch others play on a chess network.

Learning the Basics

Analysis of the software in each category will benefit those whose interest in chess is just budding or even reaching flower. The first category includes chess tutorial software used on a single microcomputer. As far as I can establish, there is only one company that publishes chess-teaching software—Enlightenment, Inc. (San Francisco, CA). In fact, Enlightenment actually publishes a coordinated library of chess-teaching software. I reviewed the complete library for this article and found it to be of excellent quality, as well as economical.

Enlightenment, Inc. has existed for over five years and markets a whopping 21 diskette sides—under six titles—for the Commodore 64 (as well as for a host of other computers). A recent price reduction makes their quality packages even more attractive. Enlightenment's software authors and support companies read like a "Who's Who" of the international chess scene. The whole series of products is called the "Living Chess Library," and

Getting Started in Chess is Easy

Anyone interested in learning or playing chess now has unlimited opportunities. If you're just interested in learning the game, or playing social games with your friends, the software discussed in the main article will certainly suffice. If you are interested, simple tournaments can be set up by playing against each other using the opponent software.

There can even be tournaments where all players are matched against one particular level of one of the game-playing pieces of software. All players who win at one level advance to the next level and continue until there is only one champion.

Family chess is another great way to play. Families can play from home in consultation matches using the *Telegames* software or even by getting on the LINC network. In these "consultation matches," all members of the family help decide the best move to make. On a rainy or snowy Saturday evening, house-to-house family chess gives total freedom and enjoyment. If you want family consultation chess with someone in another part of the country, join the LINC and play "postal" chess. You'll only need to make one move at a time, with lots of time in between to collectively decide the next best move.

If you're interested in starting a school club (or even a local adult chess organization) the United States Chess Federation provides great support. They will send you the address of any existing local clubs and the contact at your state chess club. The USCF also provides information on running local tournaments and how the ratings systems work. Newly formed chess clubs can become affiliated with the USCF for only $30 a year. Schools and college affiliate dues are only $12 annually.

One advantage of being an affiliate is the ability of local clubs to list their USCF-rated events in *Chess Life*. Joining the USCF brings you in contact with a nationwide and even international network of people, interested in chess and interested in helping others. USCF members find chess tournaments within driving distance nearly every weekend of the year. If you've just gotten a chess software program for your birthday and really haven't the slightest idea what to do with it, maybe the USCF video is for you. This basic information video, titled *In Pursuit of a King,* assumes that you know nothing about chess. But the video itself is tightly scripted. You will move quickly from the basics to more advanced strategy and tactics. In fact, there is enough information in the video to serve as an excellent reference point, even after you've played chess for years. After playing lots of games on their computer, everyone would do well to review the video again. *In Pursuit of a King* is a great companion to any software program. The video can be ordered directly from the United States Chess Federation.

Simply contact Jim Meyer, at the United States Chess Federation, 186 Route 9W, New Windsor, New York 12550, (914) 562-8350.

by John Pustai

Chess
A Computer Mate

Chess is 2000 years old, according to many legends. During its lifetime, the game has been the battle ground for millions of face-to-face combatants. But faceless combatants now exist because of a plethora of enduring microcomputer-based software. There is even software that "trains" human combatants. Still other software allows the entire world to serve as the chess battle ground, where tournament combatants may never even see their opponent's face.



GENE SMITH / BOB CLARK

Future Software

Where is chess software heading? *ChessBase* and *BookUp* are typical pieces of software written for MS DOS-compatibles and either the Atari ST or Macintosh. These software systems allow users to enter their own board games in algebraic notation. Users can then access this database at any point to study particular strategies and learn about their own mistakes and tactics. However, at this time, there is no plan to port these to the Commodore machines. Maybe Commodore chess buffs can influence those plans.

Whatever the future of commercial computer chess programs, it is certain that they are here to stay. Browsing through the "chess chatter" on the game networks reveals that there is a great interest in these programs. Publishers are noticing this second generation of interest and improving their products and their marketing strategies. Like chess itself, computer chess software will probably also see its 2000th birthday someday.



In *Paul Whitehead Teaches Chess*, students are given options in a particular situation, and are provided with commentary telling which option is best and why. Board numbers on the screen enable users to follow the logic via poster-sized Road Maps.

each of the programs is referred to as a "book." This Living Chess Library is:

Paul Whitehead Teaches Chess
(3 disks) $34.95

Guide to Chess Openings
by Jeremy Silman, USCF Senior Master
(5 disks) $34.95

The King's Indian Defense (4.e4 lines)
by Edward A. Chang, USCF Expert and Peter Biyiasas, FIDE Grandmaster
(4 disks) $19.95

The Najdorf Sicilian Defense
by Louie Ladow, USCF Expert and Peter Biyiasas, FIDE Grandmaster
(3 disks) $19.95

50 Annotated Classic Chess Games
by Paul Whitehead
(2 disks) $19.95

Bobby Fischer's Chess Career
(4 disks) $22.50

> Enlightenment's software authors and support companies read like a "Who's Who" of the international chess scene.

In addition to the amazing price-per-disk ratio, *each* package includes the *Coffeehouse Chess Monster. Monster* is a program authored by International Chess Master, Julio Kaplan, in which users play chess against another player or against the computer, or even watch the computer play against itself.

The *Monster* is a strong enough chess-playing program in its own right to be packaged separately. In fact, *Monster* was the best personal computer chess program at the 1986 World Microcomputer Chess Championship and recently tied for First Place with *Chessmaster 2000* (discussed later in this article) in the 1987 U.S. Computer Chess Open, held in Mobile, Alabama.

Each of the six packages above also comes with extensive, poster-sized Road Maps (decision trees) that enable students to follow the logic of the software-based tutorial. These Road Maps indicate the board number that can be called up on the monitor to view a particular sequence of plays being studied.

Another feature of the Library is the Express Depot. This feature allows students to skip to any part of the tutorial using the Road Maps. All of the "books" are very interactive, much like computer-aided instruction. Students have a choice of options for each move sequence being taught.

A noteworthy feature of the entire software library is the consistency of graphics, tutorial methods and commands. Each piece of software is an integral part of the entire library. Once the technique of navigating through one piece of software is learned, the student easily moves through all the other pieces. Although the commands are similar, the tutorial information on each disk is different, with very little overlap of learning material between each piece.

Still another feature of this library is the ability of the user to set up any tutorial position in the *Monster* program. In essence, students learn a given sequence of moves, hit one key, and play out the moves in the *Coffeehouse Chess Monster.* As a result, users immediately determine whether or not they learned the moves correctly.

Enlightenment's first chess product—*Paul Whitehead Teaches Chess*—was initially marketed in the United States and Germany in 1985, and debuted to accolades from all software reviewers. Author Paul Whitehead, now in his mid-20's and a top active chess player, was Chess Master at the age of 15; he achieved the rank of U.S. Junior Champion, American Open Champion, and American Class Champion at the age of 17.

Chess buffs ranging from eight-year-old beginners to U.S. Chess Federation rated Experts, will find the Whitehead software a valuable learning tool and a must to own. Today, *Paul Whitehead Teaches Chess* is used in over 500 school systems nationwide. One school system in upstate New York uses the program in the third grade. According to the teacher, "The third graders have no trouble following the directions. It's easier for them than the word processor or the LOGO program we use in the classroom."

Frank Elley—an over-1600-rated player from Santa Clara, California—also commends this chess-teaching software. "When I was scholastic coordinator for USCF, I found that schools really loved *Paul Whitehead Teaches Chess*. It's a great idea, and it's surprising that other companies have not tried the same thing. The company [Enlightenment] is run *by* chess players, *for* chess players. I found management to be consistently friendly and interested in feedback."

Enlightenment president Douglas Moss comments, "Learning chess by playing against a computer program opponent is like getting mugged in a dark alley to learn self-defense." Moss adds, "It's the serious chess person who buys our programs. If they purchase the *Paul Whitehead Teaches Chess* package, they invariably come back and buy at least two other packages from us. Also, we are starting to appeal to the latent chess player as well. We estimate that it is 100 times faster to learn chess via the computer than from a printed book. And it's better to learn chess from a tutorial."

Learning strategies and tactics—with interactive animation and lines of Whitehead's expert commentary—are the basis of the tutorial, estimated to take 40 hours



Silman's Guide to Chess Openings is structured like the rest of the Living Chess Library. Again, players are given options, with the best option discussed in depth, and in many subsequent screens.



Online games on the LINC provide both players with clocks to keep track of their time. The last move made is listed textually and also highlighted by showing the starting and ending space of the piece moved.



Games are not the only use for the LINC. There are news, mail, conferencing and general information areas.

to complete in detail. Over 600 different aspects of chess are covered, beginning with the fundamental rules of chess and discussion of chessboard layout.

Tactics include pins, forks, skewers, sacrifices, overloaded pieces and in-between moves. Detailed analysis is also made for opening principles, and end-game and middle-game play that includes castling, tied or stale-mated games and pawn promotions. End-game scenarios include same- and opposite-color bishop endings, as well as active- and passive-rook endings.

Discussions of tempo and zugzwang (see Chess Dictionary), checkmating the lone king, how to convert material or positional advantages to a win, are also included. Students also learn about playing with a pawn majority.

There is even a discussion of the value assigned to each chess piece. Also, for those people interested in learning how to read chess notation in the newspapers, a mere 15 minutes' study of the chess notation tutorial is sufficient.

As the second book in the library, the *Guide to Chess Openings* picks up where *Whitehead* leaves off and goes into even more detail of chess openings. An incredible five-disk set goes through 1500 various chess opening options for both the white and black piece players. Openings include the French, Sicilian, Caro-Kann, Pirc, Modern, Alekhines's, Center Counter Gambit. Again, the student is prompted through each opening option, and follows the possible outcomes.

Other packages—*The King's Indian Defense* and *The Najdorf Sicilian Defense*—present students with a very detailed analysis of chess moves beyond the normal opening routines. The *50 Annotated Chess Classics* allow the more advanced player to study some of the best chess games in history, again with on-screen commentary from Paul Whitehead.

Continued on page 112

Chess Dictionary

Some of the words in chess can be intimidating, but most are pretty straightforward. Here is a sampling of just a few that will help make life as a beginner a little easier:

blitz games: Chess games in which each opponent has a very small amount of time to make *all* moves. In these games as soon as one player makes a move, the other player's clock starts ticking down toward zero. Players can lose on "time." That is, if the game is still going on and they have used up the total time allotted for all their moves, they lose the game.

castling: A special move that allows two chess pieces to move at once—the switching of the relative positions with the King and either of the rooks. This move is a great defensive move for the King. However, it cannot be made if the King or the rook being switched has made any previous moves in the game.

check: When a King is under direct attack and can be captured in the next move. The attacking player offers the courtesy of notifying the attacked player, so that the King may be moved out of the direct attack position.

checkmate: When a King is under direct attack and any resulting move of the King allows capture by the opposing player on his next move. This is the end of the line (and the game) for the player under attack.

consultation game: Chess games in which there are teams of players opposing each other. The team members on each side are allowed to consult with each other to determine the best move possible.

en passant: A French phrase used for special pawn capture, occurring when one player moves a pawn two spaces (only on the initial move of that pawn) to avoid capture by another pawn. Capture is made as if the player moved the pawn only one square forward.

OTB: Short for "over-the-board" chess. When two opponents do not take days or weeks between moves to study the positions, as in postal chess.

pawn promotion: Changing a pawn to a Queen, a Bishop, a Knight or a Rook if the pawn moves completely to the other side of the chess board.

pin, fork, skewer: Names of tactics used in chess, so called because the relative positions of an attacking piece and the piece or pieces being attacked represent graphically the particular name.

ply: A move. Usually referred to in computer chess when the computer is analyzing potential moves (i.e., The computer has studied 17 plies down).

postal chess: The ability of opponents to take days, weeks or months between moves to study and research the next best move. The name originated because the usual way of communicating the moves is via the mail.

ratings: Numerical values given to chess players in accordance with their ability. These ratings help determine if potential opponents will be "too good," "too easy," or "on the same level" as the individual seeking to play chess. Values are earned over many games of play. Numerical ratings are calculated using a complex formula. There are separate ratings for both OTB chess and postal chess.

simuls: A chess game in which one exceptionally good player plays against more than one opponent simultaneously. The expert usually moves from one board to the next, making his move at each board and allowing each player in the group time to think of his moves until he returns. *Simuls* are becoming popular on the LINC chess network.

stalemate: Neither a win nor a loss. Occurs when one opponent cannot make a move but is not in "check."

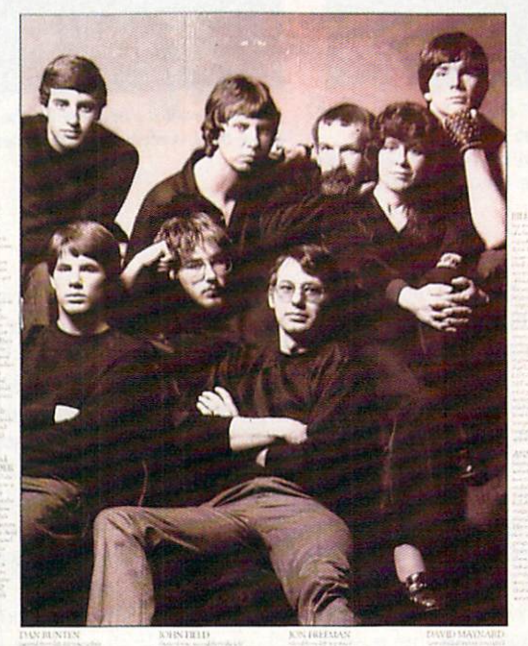
tempo: Refers to the type of moves—aggressive and attacking, retreating or passive with no net gain or loss of positional strength.

USCF: United States Chess Federation—the official chess organization in the United States.

zugzwang: A move that is "forced" by an opponent's position or previous move.

WE SEE FARTHER

SOFTWARE ARTISTS?









BILL BUDGE

ANNE WESTFALL

MIKE ABBOTT and MATT ALEXANDER

DAN BUNTEN

JOHN FIELD

JON FREEMAN

DAVID MAYNARD









ELECTRONIC A

We See Farther: EA's first major ad campaign.

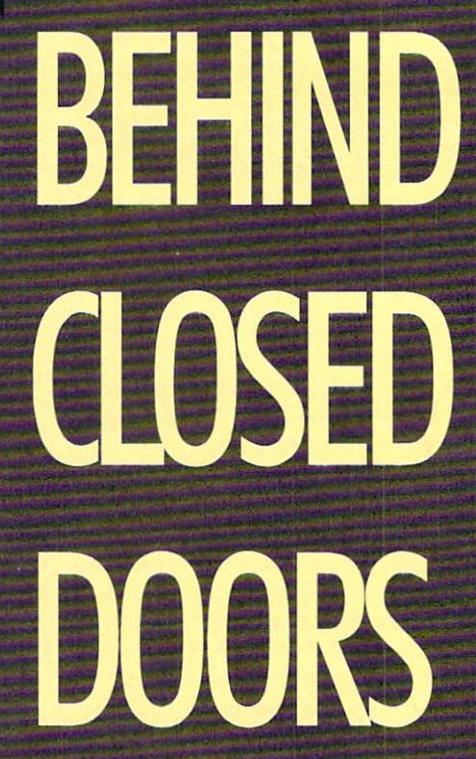
M. U. L. E.

ARCHON

THE LIGHT AND THE DARK

AXIS ASSASSIN

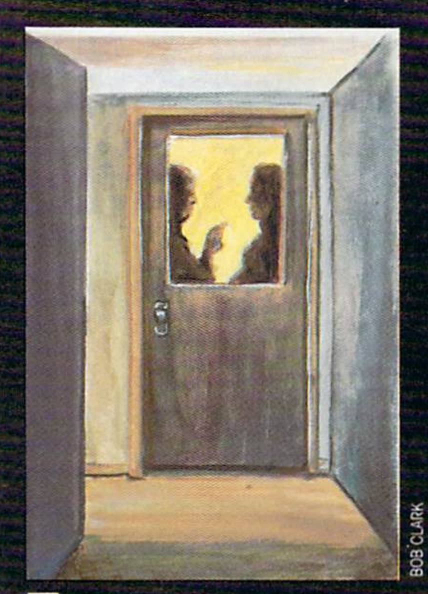
HARD HAT MACK



BEHIND CLOSED DOORS

by John Jermaine

What do you know about Electronic Arts? Most readers will answer it's the birthplace of programs like *Skate or Die, Dr. J and Larry Bird Go One-on-One, Chuck Yeager's Advanced Flight Trainer,* etc. Beyond that, the average consumer (including myself) knows very little about the company in general. Since EA is currently celebrating its fifth anniversary, I thought I might commemorate the event by giving you a behind-the-scenes look at this mysterious corporation. When all is said and done, I'm sure you'll enjoy this detailed discussion of the company's past, present and future.


BOB CLARK

Electronic Arts, the 136th entrant into the microcomputer software industry, was founded during the summer months of 1982. On May 20, 1983, EA released its first line of products to the world. Those titles included: (1) *Worms*, (2) *Archon*, (3) *M.U.L.E.*, (4) *The Pinball Construction Set* and (5) *Axis Assassin*. Although the initial releases were written for the Atari 800 personal computer, Commodore 64 conversions of that material appeared on the market a short time later. The rest is history.

Electronic Arts currently generates software for the Commodore 64, Commodore Amiga, Apple II series, Apple Macintosh, IBM PC-compatibles, Atari 800 and ST and Tandy 1000 home computer systems. The company employs 12 full-time programmers and enlists the skills of approximately 100 external artists to develop more than 100 titles for various personal computers every year. EA has shipped over six million programs to date, while 32 of their titles have earned more than a million dollars.

Bing Gordon, vice president of Electronic Arts Studios, has been with the company from the very beginning. He's 38 years old, and his interests include snow skiing, wind surfing, and (believe it or not) ice hockey. Gordon was a prime candidate to interview for a project of this nature, because he knows something about everything that happens at EA.

John Jermaine: What led to the founding of Electronic Arts?

Bing Gordon: That's an interesting story. Back in 1982 the home entertainment industry was going through a number of changes. Home video game sales had reached their peak, and the public was looking for something more sophisticated. Trip Hawkins, then a director of marketing at Apple Computer, believed it was only a matter of time before microcomputers (with disk drives) became the accepted medium for interactive electronic entertainment in the home. Let's face it, approximately one million homes had personal computers by 1980. Marketing experts were also predicting that over 25% of the families in this country would own a microcomputer by the end of the decade. If that final prediction came true, someone would have to generate a special line of software products to satisfy the needs of the growing consumer market. Hawkins believed he could accomplish such a feat, so he left Apple in May of that year to make his vision of the future a reality.

Shortly after his departure from Apple, Trip invited six of his pals over to the house for dinner. The guest list included: Rich Melman, Jeff Burton (he's currently running our subsidiary in Japan), Pat Marriott, Dave Evans, Joe Ybarra and myself. Even though most of us had good-paying jobs at Apple and Xerox, Trip gave everyone the opportunity to participate in his new business venture. After hearing the presentation no one could turn him down. Consequently, the group spent most of the evening discussing every aspect of the company and its possible goals for the future. I remember hearing the same words coming up in the conversation over and over again: quality, integrity, achievement and teamwork. These values were important to us then, and we still believe in them today. In case you're interested, nobody asked Trip about the profit potential of the business or how much money they would earn in the long run. Everyone believed in Hawkins and his dream, and that was that.

Jermaine: Was EA ever a "spare bedroom" operation?

Gordon: No, it wasn't. When Trip left Apple, he built up a relationship with Don Valentine (who had already funded Apple Computer and Atari). Valentine is probably the most successful venture capitalist in Silicon Valley. Anyway, Don told Trip, "If you want to start a new business, I'll give you an office." We used that first office (part of Valentine's suite of offices in Menlo Park, California) from July through September of 1982. It's funny to look back on those times because we often had seven people working in that room, seated around a large table. Trip was constantly writing things down on huge pieces of paper and attaching them to the wall. This practice might have seemed peculiar to an outsider, but it allowed us to see everybody's thoughts on an issue at once. The company's first business plan was also created in this manner.

Bing Gordon



EA Publications

Jermaine: Who were the first company officers?

Gordon: By October of 1982, we were well organized and ready to get down to business. Trip Hawkins naturally became the president of the new company. Rich Melman ran sales and marketing, while I took command of advertising and packaging. Joe Ybarra, Pat Marriott and Dave Evans were our first software producers, and Jeff Burton was the only salesperson at the time. New additions to the roster included: Stephanie Ybarra (the administrative assistant), Tim Mott became the head of research and development, and two engineers (Dave Maynard and Steve Hayes) were hired to take care of technical problems. ***[Editor's Note:** Hawkins, Gordon, Burton, Maynard and Hayes are still with EA today.]*

Incidentally, Dave Maynard created *Worms* (one of our initial software releases) shortly before he entered the fold. The story of how we selected the company name is also very interesting. I'll ask Trip Hawkins to tell it to you later.

Jermaine: Who designed the EA logo?

Gordon: It was created by a guy named Barry Deutsch (who was one of two partners in the firm Steinhilber, Deutsch and Gard). Among other things, that group also designed the packaging art for the Grid Computer and the Henry Weinhard beer label. During the final days of 1982 Deutsch came up with a novel idea for our corporate symbol. He took the basic building blocks of computer graphics (the square, circle and triangle), gave the figures three dimensions (transforming them into a cube, sphere and tetrahedron), and rastorized the image to generate the illusion that it was appearing on a monitor screen. We were very pleased with this distinctive logo design, which is still used today by Electronic Arts.

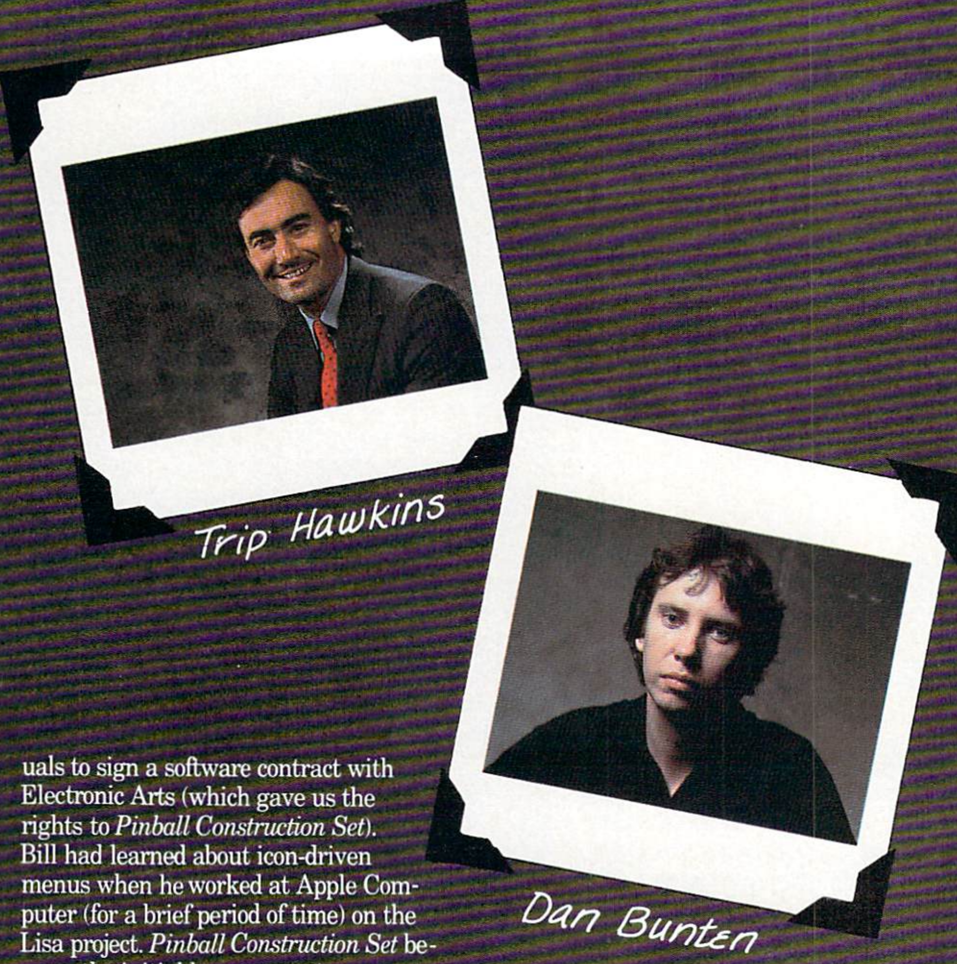
Jermaine: Can you share some information about the early EA software?

Gordon: In 1982 approximately half of the programs on the best-seller charts were home computer versions of coin-op arcade games. Things like *Frogger, Asteroids, Pacman,* etc. were all very popular at the time. Even though we wanted to generate the same type of excitement in our product line, the company philosophy has always been to develop sophisticated game software which is easy to play and can be played for a long period of time. I believe that's the reason we're still around five years later, while many of our competitors have fallen by the way side.

Bill Budge was one of the first individuals to sign a software contract with Electronic Arts (which gave us the rights to *Pinball Construction Set*). Bill had learned about icon-driven menus when he worked at Apple Computer (for a brief period of time) on the Lisa project. *Pinball Construction Set* became the initial home computer game to feature this unique form of picture menuing which is now a standard component of many programs.

Cut And Paste, on the other hand, was written internally for our own use. Everyone at Electronic Arts had an Apple II computer on their desk, so the research and development people created a special word processor tailored to the needs of the entire group. During the first two years of the company's existence, we cut and pasted together mounds of important documents. This product was eventually translated to three other systems (including the Commodore 64), and the consumer quickly learned it was equally powerful in a home environment. By the way, many other computers have replaced the Apple II's as the company business computers since 1984.

Hard Hat Mack was developed by two high school students in San Diego, California (Michael Abbot and Matthew Alexander). Their program was basically a three-level arcade game that challenged you to finish constructing a heavy duty building. I liked this particular game because it looked good, played well and simulated a number of problems that commonly plague the construction business (OSHA inspectors, neighborhood vandals, etc.).


Trip Hawkins

Dan Bunten

Will Harvey, the creator of *Music Construction Set*, was another talented California student. He originally developed his music generating software just to learn about making music for his *Lancaster* computer game. Incidentally, some of the icons in *Music Construction Set* were patterned after the ones used in Bill Budge's *Pinball Construction Set.* Will actually contacted Budge and said, "I really like your work. Please look at my music program and give me some good advice." Bill suggested it might be wise to submit it to us for evaluation. We negotiated a deal with Will, shortly after that conversation took place. I really don't know if *Lancaster* was ever published, but *Music Construction Set* has definitely survived the test of time.

These last two tales illustrate a point that needed to be made: we carefully examine every software submission because any one of them could be the best-selling product of tomorrow.

Dan Bunten is another interesting individual who has been associated with the company for many years. He's the 39-year-old president of Ozark Softscape and the designer of many of its games. His interests include hiking and

We carefully examine every software submission because any one of them could be the best-selling product of tomorrow.

reading about science, nature and psychology. I really enjoyed interviewing Dan, because he spoke frankly about working with Electronic Arts.

Jermaine: Tell me about the early days of Electronic Arts.

Dan Bunten: Some of your readers might remember the artsy EA fold-out poster, which appeared in major computer publications during the fall of 1983. That "We See Farther" promotion was a major component of the company's first publicity campaign. To set the record straight, I'd like to tell you how the poster was made.

On April 6th of that year, I found myself in a hot San Francisco photography studio. My son had been born while I was away on business, so I was anxious to get the pictures taken and return home to Little Rock (AR) as quickly as possible. The photographer hired for this project was a seasoned veteran with a number of rock and roll album covers under his belt. He had a basic plan of action for the poster: bring a number of EA software developers together, position them in artistic poses, and get them to act as if they're having a good time with some of their friends. That was a great idea alright, but several factors made it difficult to do the job right.

First of all, most of us were strangers to one another. It was hard to treat these people like friends, when I had just met Bill Budge and barely knew who Jon Freeman was. Secondly, we had to strike our poses on sawhorses. Before long, our rear ends and knees were beginning to smart.

To make matters worse there was friction on the set between the photographer and his assistant. The guy would always smile and ask us to please pose in a certain manner. A moment later, he was usually cussing out his helper for supposedly not following his directions properly.

I'm afraid this hostile environment made everybody nervous and ready to quit. After posing for pictures most of the afternoon, John Field (author of *Axis Assassin*) ended the session by suddenly fainting. Ironically, the last picture that was taken before he passed out was the one the photographer used for the poster.

One more thing should be mentioned here: Bill Budge was on his way to a sort of biker/hippie party in San Francisco, when he stopped by the studio for the photo shoot. That's why Bill wears chains, jeans, a black T-shirt and leather gloves in the picture. By the way, this "tough guy" image was totally out of character for him.

Jermaine: Is it true that Jon Freeman and Anne Westfall of Freefall Associates found a way to consistently beat you at *M.U.L.E.*, a computerized board game you personally designed?

Bunten: Yeah, it's true [he says laughing]. Several years ago, Jon and Anne (the developers of *Archon, Murder on The Zinderneuf*, etc.) played the game so often that they memorized the maps. In other words, they could identify a particular world by the layout of its mountains. Then it was just a matter of remembering which plots of land to buy and where to dig for crystite deposits. This strategy always worked because the worlds in *M.U.L.E.* were generated from a single randomized seed (containing a relatively small number of maps). When all was said and done, these *M.U.L.E.* experts were practically unbeatable back then. Jon and Anne really made me look bad on several different occasions, and I didn't know how they were doing it at the time.

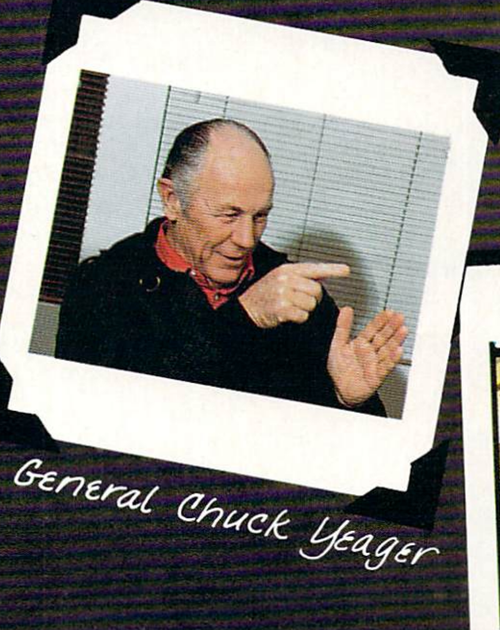
About a year ago, I had the golden opportunity to get even with them. All of us attended a special *M.U.L.E.* elimination tournament held in California. Believe it or not, Dave Grady (one of the EA producers at the time) came in first, and I finished second because we helped each other out as much as possible. My old foes, however, had lost their edge. They no longer had the game maps memorized.

In case you're interested, an early version of *M.U.L.E.* was meaner and more devious than the one we released to the public. That program allowed you to steal a *M.U.L.E.* unit from another player or simply chase it off his property. We quickly discarded these negative ideas because parents wouldn't approve of them, and they really didn't add anything to the game play.

Jermaine: What inspired you to develop *Seven Cities of Gold*?

Bunten: While I was still a teenager my uncle became a missionary in South America. He was always sending us ad-

Continued on page 108



General Chuck Yeager

Eddie Dombrower, Earl Weaver



by John Iovine

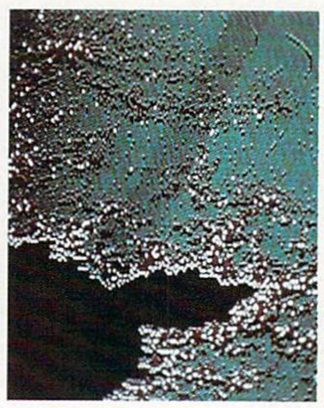
Mandelbrot Graphics

for the Commodore 128

This month, as promised, we're running the Commodore 128 listing for Mandelbrot Graphics.

Here are two data sets to try on your own.





	Picture 1	Picture 2
XL	.299786065	.302263987
XR	.309888364	.303788863
YT	.0278607628	.0237179796
YB	.0228643152	.0231907163

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Mandelbrot 128

```
10 REM MANDELBROT PROGRAM C-128'BWDD
12 IF X=0 THEN X=1:GRAPHIC 3,1'FJDE
14 REM DEFINE SPRITE'BMRF
16 FOR N=3584 TO 3646:READ A:POKE N,A
   :NEXT'GQWK
18 DATA 255,255,255,128,0,1,128,0,1,
   128,0,1,128,0,1,128,0,1,128,0,
   1'BJYQ
20 DATA 128,0,1,128,0,1,128,0,1,128,0,
   1,128,0,1,128,0,1,128,0,1,128,0,
   1'BNLK
22 DATA 128,0,1,128,0,1,128,0,1,128,0,
   1,255,255,255,255,255,255'BFHL
24 GRAPHIC 5'BBTD
26 REM MANDELBROT PROGRAM C-128'BWDK
28 REM JOHN IOVINE'BKKJ
30 PRINT"[CLEAR]":PRINT"[DOWN2]
   MANDELBROT PROGRAM C-128 MAIN MENU"
   :PRINT'DCWK
32 PRINT" 1) VIEW DIRECTORY"'BAGG
34 PRINT" 2) LOAD MANDELBROT
   PICTURE"'BAYK
36 PRINT" 3) VIEW MANDELBROT
   PICTURE"'BACM
38 PRINT" 4) INPUT COORDINATES"'BAAN
40 PRINT" 5) CHANGE COLORS"'BAUE
42 PRINT" 6) VIEW & CREATE MANDELBROT
   PICTURE"'BANL
44 PRINT" 7) SAVE MANDELBROT
   PICTURE"'BATL
46 PRINT" 8) QUIT"'BAFI
48 INPUT"MENU CHOICE 1 THUR 8";A'BCDO
50 IF A <0 THEN 56'DERD
52 IF A>8 THEN 56'DEXF
54 ON A GOTO 248,228,260, 58,148,162,
   206,160'CGAM
56 PRINT"ERROR, PLEASE ENTER NUMBER
   BETWEEN 1-8":GOTO 48'CDXS
58 PRINT"[CLEAR] [DOWN2]
   ENTER NEW COORDINATES.."'BATQ
60 INPUT"INPUT XL";XL:INPUT"INPUT XR";
   XR:INPUT"INPUT YT";YT
   :INPUT"INPUT YB";YB'EPGR
62 PRINT"[CLEAR] ARE THESE THE
   COORDINATES YOU WANT"'BAXO
64 PRINT"XL = ";XL:PRINT"XR = ";XR
   :PRINT"YT = ";YT:PRINT"YB = ";
   YB'EPQR
66 INPUT"( Y/N OR M FOR MENU)";A$'BDFO
68 IF A$="Y"THEN 76'DEQN
70 IF A$="N" THEN 58'DEFG
72 IF A$="M" THEN 24'DECH
74 GOTO 66'BCTH
76 PRINT"[CLEAR]"'BATK
78 PRINT"[DOWN2]ENTER 1 TO PROCEED TO
   DRAW"'BAXS
80 PRINT"[DOWN2]ENTER 2 TO RETURN TO
   MENU"'BAVL
82 PRINT:PRINT'CBHH
84 INPUT"INPUT 1 OR 2";A'BCDL
86 IF A=1 THEN 94'DETM
88 IF A=2 THEN 24'DENO
90 PRINT"ANSWER 1 OR 2 ONLY"
   :GOTO 84'CDHL
92 REM COORDINATES'BLBK
94 PRINT"[CLEAR,DOWN3]DRAWING"
   :DX=(XR-XL):DY=(YB-YT)'FSSU
96 GRAPHIC 1,1:FAST'CFAN
98 POKE 53280,0     :REM BORDER
   BLACK'CTQS
100 POKE 53281,3     :REM BACKGROUND
    GREY'CWQB
102 SM=3:CT=48'CIPA
104 FOR X0=XL TO XR STEP(DX)/159'FNRF
106 FOR Y=YT TO YB STEP(DY)/199'FMTH
108 A=X0*X0-Y*Y+X0:B=2*X0*Y+Y:C=0'KTDO
110 R=A*A-B*B+X0:I=2*A*B+Y:C=C+1'LRIH
112 A=R:B=I'CFMA
114 IF R<-10^16 THEN 130'FIKE
116 IF R<SM THEN IF C<CT THEN 110'GJOI
118 X1=INT((X0-XL)/((DX)/159))'FTJL
120 Y1=INT((Y-YT)/((DY)/199))'FSCE
122 IF C<4 THEN GOSUB 140
    :GOTO 130'FJMD
124 IF C<6 THEN GOSUB 142
    :GOTO 130'FJQF
126 IF C<48 THEN GOSUB 144'EGKG
128 IF X1=>158 THEN SLOW:GOTO 146'GKLL
130 GET K$:IF K$<>""THEN SLOW
    :GOSUB 274:FAST'IMBG
134 NEXT Y,X0'BERD
136 X=2*X1+2'DFBH
```

Continued on page 80

Continued from page 78

```
138 DRAW 1,X,Y1:RETURN'CHYJ
140 X=2*X1+1 :GOSUB 138:RETURN'FKSE
142 GOSUB 136:RETURN'CENC
144 GOSUB 136:X=X-1:GOSUB 138
    :RETURN'FMBI
146 GOTO 24'BCNF
148 REM CHANGE COLORS'BMHL
150 FOR X=1 TO 255'DFBC
152 FOR I=7168 TO 8167:POKE I,X
    :NEXT I'FPKI
154 GET K$:IF K$=""THEN 154'EIEI
156 IF K$="Q"THEN POKE 49500,X
    :GOTO 24'FMJL
158 NEXT X'BBRI
160 END'BACB
162 GRAPHIC 1'BBPE
164 SPRITE 1,1,3'BGQG
166 MOVSPR 1,160,100'BKFJ
168 X=PEEK(49500)'CIFM
170 FOR I=7168 TO 8167:POKE I,X
    :NEXT'FOMI
172 POKE VIC+21,1'CHBG
174 GET A$'BCGH
176 IF A$=""THEN 174'DFDK
178 IF A$="L"THEN MOVSPR 1,-1,+0
    :GOTO 174'HMFR
180 IF A$="R"THEN MOVSPR 1,+1,+0
    :GOTO 174'HMKK
182 IF A$="U"THEN MOVSPR 1,+0,-1
    :GOTO 174'HMOM
184 IF A$="D"THEN MOVSPR 1,+0,+1
    :GOTO 174'HMVO
186 IF A$="E"THEN 190'DFPM
188 GOTO 174'BDLM
190 HP=PEEK(53248):VP=PEEK(53249)'ETPL
192 HP=HP-24:HP=HP/2:VP=VP-50'GTDP
194 DX=(XR-XL):DY=(YB-YT)'ERAP
196 XR=(XL)+((HP+24)*(DX/159))
    :XL=(XL)+((HP)*(DX/159))'JQTA
198 YB=(YT)+((VP+21)*(DY/199))
    :YT=(YT)+((VP)*(DY/199))'JQQC
200 SPRITE 1,0'BEUW
202 GRAPHIC 5'BBTY
204 GOTO 62'BCPA
206 REM SAVE COORDINATES & BINARY
    PIC'BAQJ
208 PRINT"[CLEAR]"'BATF
210 PRINT"[DOWN4]":INPUT"FILENAME";
    F$'CEMB
212 OPEN 1,8,2,"@0:"+F$+".NUM,S,
    W"'DIFF
214 PRINT#1, XL:PRINT#1, XR'CJNE
216 PRINT#1, YT:PRINT#1, YB'CJHG
218 CLOSE 1'BBIF
220 F$=F$+".PIC"'CELB
222 Q$=CHR$(34)'CGPC
224 PRINT"[CLEAR]BSAVE"Q$F$Q$",
    P7168TOP16383":POKE 842,19
    :POKE 843,13:POKE 208,2:END'FCOP
226 GOTO 26'BCPE
228 REM LOAD COORDINATES & BINARY
    PIC'BABN
230 PRINT"[CLEAR]":PRINT"[DOWN3,
    RIGHT3]"'CBMB
232 INPUT"FILENAME";F$'BDOE
234 OPEN 3,8,3,F$+".NUM,S,R"'CIWH
236 INPUT#3,XL,XR,YT,YB'BNCI
238 CLOSE 3'BBKH
240 LOAD F$+".PIC",8,1'CGRD
242 FOR I=1024 TO 2023:POKE I,18
    :NEXT'FPZI
244 GOTO 26'BCPE
246 END'BACG
248 REM DIRECTORY'BJRL
250 PRINT"[CLEAR]"'BATC
252 DIRECTORY'BAMD
254 PRINT:PRINT:PRINT"PRESS ANY KEY
    TO CONTINUE"'DCHO
256 GET K$:IF K$=""THEN 256'EIHL
258 GOTO 26'BCPJ
260 GRAPHIC 3'BBRD
262 X=PEEK(49500)'CIFH
264 FOR I=7168 TO 8167:POKE I,X
    :NEXT'FOMM
266 GET K$'BCQJ
268 IF K$=""THEN 266'DFPM
270 GRAPHIC 5'BBTE
272 GOTO 24'BCNF
274 FOR T=1 TO 350:NEXT:POKE 842,0
    :POKE 208,0'GSPO
276 GET K$:IF K$=""THEN 276'EIJN
278 IF K$="C"THEN RETURN'ECLO
280 IF K$="E"THEN RESTORE:GOTO 24'FFCI
```

END

by Rev. Paul R. Schmidtbleicher

System SuperBoot
for the Commodore 128

I bought my Commodore 128 because it promised more power, larger memory and compatibility with all of my Commodore 64 software. I fell in love with the 128 autoboot feature. Having acquired a good library of 64 programs—both commercial and public domain—I found that with many of these programs not only would I have to make sure that the 128 was in 64 operating mode, but I also had to ensure that the two 1571 drives which I own were locked into 1541 operating mode. I would then have to load and run the 64 program. There had to be a better way!

System SuperBoot was my solution. The program creates an autoboot sector of less than 256 allotted bytes which will be put onto track one sector zero of any 64 program disk having that sector free. As with many 128 programs, all one has to do is power-up or press the reset button to auto boot. The SuperBoot will switch from 128 Mode to 64 Mode; Lock 1571 drive 8 and 1571 drive 9 (if present) into 1541 mode and then autoload and run the 64 program. It will do this for BASIC programs; machine language programs (you must supply the start (SYS) address at the prompt; and Auto Run or self-booting 64 programs. The code which accomplishes this is transferred to your 64 disk by this program.

Using System SuperBoot

System SuperBoot is a 128 program. Make sure you enter it in the 128 mode and save a copy before using it. The data statements and CHR$(x) are critical, so double check them before using SuperBoot. When you run it, it will ask you to supply the disk that you intend to SuperBoot. Upon pressing RETURN the program will read the BAM (Block Allocation Map) and sector zero of track one. The BAM tells us if the Sector is being used by another program. If not, it may already be an auto boot. You have the chance to continue or abort. If there is no problem the program will continue. If the sector is somehow used, you can still go on (carefully) and overwrite whatever is on the boot sector.

You will be asked for the name of the (64) program to be SuperBooted. The name should be typed in as it appears in the directory of the disk. The wild card "*" is permitted. You will then be asked for the program type:

1. BASIC: This program will load into BASIC memory and run. A machine language program that runs like a BASIC program should be classified as BASIC.

2. AutoRun: These programs are self-booting on the 64. They may be backups of commercial programs, etc. SuperBooter will in this case jump (JMP) to the LOAD command in assembly language which turns control over to the autorun program as it is loading.

3. Machine Language: This is a program which is commonly loaded with LOAD "filename",8,1; then you must SYS an address. If you want this kind of program SuperBooted, be prepared with the SYS address and enter it at the next prompt.

Once all the information is entered, you will have another chance to continue or abort. If you abort you will have to re-run the SuperBoot program and re-enter the information. You are now prompted to have everything ready: Drive on, proper disk in the drive, write protect off, etc. Upon pressing RETURN, the SuperBoot sector will be created and this program will end.

When you press the reset button on the 128 with a SuperBoot disk, the 128 will go to 64 mode, your 1571s will become locked into 1541 mode and the selected 64 program will be auto booted. The program boot reads error conditions and the error channel of the drives so that a 1541 or a second drive that is not turned on will not crash the boot sector program.

One final note of caution: a 64 program created and saved in 128 mode does not SuperBoot correctly. Commodore 64 programs should be created in 64 mode. This little gem should make entering 64 mode as easy as booting up a 128 program. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

System SuperBoot

```
150 GRAPHIC 5:PRINT"[CLEAR]
    USE THE 40 COLUMN SCREEN"
    :GRAPHIC 0:COLOR 0,1:COLOR 4,1
    :COLOR 5,5'GQTP
160 PRINT"[CLEAR] [RVS]
    **SUPERBOOT FOR C-64 MODE
    PROGRAMS**"'BALL
170 PRINT"[SPACE2]BOOT WILL LOCK
    1571'S TO 1541 MODE"'BALL
180 PRINT"[SPACE2]1541 MODE IS SET
    FOR DRIVES 8 & 9"'BAFL
190 PRINT"[SPACE2]THE C-128 WILL BE
    SET IN C-64 MODE"'BABN
200 PRINT"[SPACE3]YOUR PROGRAM WILL
    BE AUTOBOOTED":COLOR 5,4
    :WINDOW 0,7,39,24'DPQK
210 PRINT"[SPACE3]PLACE THE DISK TO
    BE AUTO BOOTED"'BAYG
220 PRINT"[SPACE3]INTO DRIVE 8[SPACE5]
    [PRESS RETURN][DOWN]"'BAYH
230 GET KEY K$:IF ASC(K$)<>13 THEN
    GOTO 960'IMJG
240 OPEN 15,8,15,"IJ":IF DS THEN
    PRINT"[CLEAR,SPACE10]
    ** DISK ERROR **":GOTO 960'FPMM
250 OPEN 8,8,8,"#":PRINT#15,
    "U1 8 0 18 0":PRINT#15,"B-P";8;5
    :GET#8,BM$'EABL
260 PRINT#15,"U1:8 0 1 0"
    :FOR I=0 TO 24:GET#8,A$
    :SC$=SC$+CHR$(ASC(A$)):NEXT'KDRQ
270 IF (ASC(BM$)AND 1)=0 THEN
    BEGIN'GKLJ
280 IF LEFT$(SC$,3)="CBM" THEN
    BEGIN'FIBK
290 PRINT"**** DISK ALREADY HAS AN
    AUTOBOOT ****":PRINT"NAME: ";:I=8
    :DO'EGMT
300 A$=MID$(SC$,I,1):PRINT A$;:I=I+1
```

```
    :LOOP UNTIL A$=CHR$(0):PRINT'KBVJ
310 BEND: ELSE BEGIN'DDJB
320 PRINT"=BOOT SECTOR USED BY
    ANOTHER PROGRAM="'BADJ
330 BEND'BBXB
340 INPUT"[DOWN,RVS]CONTINUE (Y/N)
    [RVOFF,SPACE4,RVOFF]N[LEFT3]";
    A$'BDHJ
350 IF A$<>"Y" THEN GOTO 960'FFYG
360 BM = 1'BDNE
370 BEND'BBXF
380 PRINT"[DOWN,RVS]ENTER PROGRAM TO
    BE AUTO BOOTED"'BASO
390 PRINT" (TO 16 CHARACTERS) "'BAYL
400 PRINT"[SPACE20,UP2]"
    :INPUT"[DOWN,SPACE2]PRG[LEFT5]";
    PG$'CFSI
410 IF LEN(PG$)>16 THEN PRINT"[UP2]"
    :GOTO 400'GLTG
420 PRINT"[DOWN]PROGRAM TYPES
    :[SPACE2]1) BASIC PROGRAM"'BAGJ
430 PRINT"[SPACE16]2) AUTOSTART
    C-64"'BACH
440 PRINT"[SPACE18](NORMALLY SELF
    BOOTS)"'BAFK
450 PRINT"[SPACE16]3) MACHINE
    LANGUAGE"'BABK
460 INPUT"[RVS]ENTER TYPE 1-3[RVOFF]";
    TP$'BEBJ
470 IF VAL(TP$)>3 OR VAL(TP$)<1 THEN
    PRINT"[UP2]":GOTO 460'JQCP
480 IF TP$=""THEN 960'DGYJ
490 IF TP$="3"THEN INPUT"ENTER
    DECIMAL SYS ADDRESS";SA$
    :IF SA$=""THEN 960'HOFV
500 SA=VAL(SA$):HB=INT(SA/256)
    :LB=SA-(HB*256)'IEYL
510 PRINT"[CLEAR,RVS]PRG TO BE
    AUTOBOOTED[RVOFF] "PG$'BDNI
520 PRINT"[DOWN,RVS]PRG TYPE[RVOFF]
    "TP$:PRINT"1=BASIC; 2=AUTO;
    3=ML"'CEPL
530 IF TP$="3"THEN PRINT"ADDRESS =
    "SA$'EGMI
540 INPUT"[DOWN,RVS]CONTINUE (Y/N)
    [RVOFF,SPACE4,RVOFF]N[LEFT3]";
    A$'BDHL
550 IF A$<>"Y" THEN GOTO 960'FFYI
560 PRINT"[DOWN2]MAKE SURE DRIVE 8
    AND DISK ARE READY"'BASP
570 PRINT"[SPACE4][PRESS RETURN TO
    CONTINUE]"'BANO
580 GET KEY A$:IF ASC(A$)<>13 THEN
    GOTO 960'IMOO
590 PRINT"[DOWN,RVS]SENDING DATA AND
    WRITING BOOT SECTOR"'BABS
600 PRINT#15,"B-P 8 0":FOR I=1 TO 16
    :FL$=FL$+CHR$(160):NEXT
    :PG$=LEFT$((PG$+FL$),16)'LNEQ
610 FOR I=0 TO 6:READ D$:D=DEC(D$)
    :PRINT#8,CHR$(D);:NEXT'JUQK
620 PRINT#8,PG$;'BGQD
630 FOR I=23 TO 43:READ D$:D=DEC(D$)
    :PRINT#8,CHR$(D);:NEXT'JWMN
640 PRINT#8,PG$;'BGQF
650 FOR I=60 TO 121:READ D$:D=DEC(D$)
    :PRINT#8,CHR$(D);:NEXT'JXIP
660 IF TP$="1"THEN BEGIN'EESJ
670 PRINT#8,CHR$(32)CHR$(213)CHR$(255)
    CHR$(134)CHR$(45)CHR$(132);'HGTR
680 PRINT#8,CHR$(46)CHR$(32)CHR$(142)
    CHR$(166)CHR$(32)CHR$(96);'HEHS
690 BEND'BBXK
700 IF TP$="2"THEN BEGIN'EETE
710 PRINT#8,CHR$(76)CHR$(213)CHR$(255)
    CHR$(134)CHR$(45)CHR$(132);'HGCM
720 PRINT#8,CHR$(46)CHR$(32)CHR$(142)
    CHR$(166)CHR$(32)CHR$(96);'HEHN
730 BEND'BBXF
740 IF TP$="3"THEN BEGIN'EEUI
750 PRINT#8,CHR$(32)CHR$(213)CHR$(255)
    CHR$(169)CHR$(227)CHR$(72);'HGCR
760 PRINT#8,CHR$(169)CHR$(122)CHR$(72)
    CHR$(76)CHR$(LB)CHR$(HB);'HEIR
770 BEND'BBXJ
780 FOR I=134 TO 255:READ D$:D=DEC(D$)
    :PRINT#8,CHR$(D);:NEXT'JYQT
790 PRINT#15,"U2:8 0 1 0"
    :IF BM=0 THEN PRINT#15,
    "B-A 0 1 0"'FKAS
800 CLOSE 8:CLOSE 15:WINDOW 0,0,39,24
    :PRINT"[CLEAR]**** OPERATION
    SUCCESSFUL ****":END'FRNQ
810 DATA 43,42,4D,00,00,00,00'BUEH
830 DATA 00,00,A0,00,B9,4B,0B,99,00,
    80,C8,D0,F7,A9,00,8D,00,FF,4C,4D,
    FF'BMXS
850 DATA 55,30,3E,48,30,00,55,30,3E,
    4D,30,00,49,30,00,09,80,5E,FE,C3,
    C2'BMPT
860 DATA CD,38,30,78,A2,FB,9A,20,8A,
    0B,20,A6,0B,CE,E1,0B,A0,0C,20,B6,
    0B'BMYV
870 DATA A9,10,A2,2C,A0,0B,20,BD,FF,
    A9,00,A2,08,A0,FF,20,BA,FF,A9,
    00'BJVV
890 DATA A6,4C,AE,A7,A2,00,8E,16,D0,
    8E,11,D0,20,84'BQVT
900 DATA FF,20,87,FF,20,8A,FF,20,81,
    FF,58,20,53,E4,20,BF,E3,60,20,
    AC'BJDP
910 DATA 0B,EE,E1,0B,A0,06,20,B6,0B,
    A0,00,4C,B6,0B,20,DC,0B,B9,3C,
    0B'BJOQ
920 DATA F0,06,20,A8,FF,C8,D0,F5,20,
    AE,FF,AD,E1,0B,20,B4,FF,A9,6F,
    20'BJRS
930 DATA 96,FF,20,A5,FF,C9,0D,D0,F9,
    4C,AB,FF,A9,00,85,90,A9,08,20,
    B1'BJUS
940 DATA FF,A9,6F,20,93,FF,A5,90,D0,
    01,60,68,68,60,00,00,00,00,00,
    00'BJMT
950 DATA 00,00,00,00,00,00,00,00'BXHM
960 CLOSE 8:CLOSE 15:WINDOW 0,0,39,24
    :PRINT"[CLEAR]**** OPERATION
    ABORTED ****":END'FRLW
```

END

by Bob Blackmer

Logjam

for the Commodore 64


ED SAUK

This program is a white water rafting adventure for the Commodore 64. The object of the game is to pilot a rubber raft through turbulent rapids while dodging logs from a logging operation upstream.

A group from a nearby camp were white water rafting and met with disaster after misreading their map. They entered a tributary of the main river which is used by a local paper company to bring logs to the sawmill.

You will be using a 12-foot yellow raft equipped with a ten-horsepower outboard motor. You must navigate the treacherous stretch of river and rescue as many of the campers as you can. You will see them bobbing and waving among the logs.

All information for the game appears on the right side of the screen. At the top is a visual indicator of the current condition of your raft. It starts as a solid black bar that becomes shorter as your contact with the logs takes its toll.

The number of campers rescued is the next indicator and the most important, as they represent lives you have saved. Below this is the level you're currently playing. You advance a level for every twenty campers rescued. The speed of the rapids and logs will also increase, testing your abilities even further.

At the bottom is the number of campers you have failed to rescue. You will feel a lot better and play longer if you keep this total down. The original multi-voice theme music used in this program can also be played in a variety of ways. Besides the default instruments, you can press the function keys F1, F3 and F5 to select different instrument configurations. Pressing F7 will result in silence, which comes in handy if you play late at night. The game also features a pause control which you activate using the SHIFT LOCK key.

When the black bar that shows your raft's condition runs out, so do you. Your raft helplessly sinks to the bottom of the churning waters.

You can also achieve game over status by failing to rescue 25 campers. Pressing the fire button will start a new game.

After you have typed in and saved a copy of the program, type RUN and press RETURN. Use a joystick plugged in port 2 to control your raft. The ML code that is created by the listing is less than 2K in length. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Logjam

```
10 CK=0:FOR I=49152 TO 51191'EPHC
20 READ A:CK=CK+A:POKE I,A:NEXT'FMDD
30 IF CK<>238595 THEN PRINT
   "ERROR...CHECK DATA":STOP'GJGJ
40 SYS 49152'BFMB
50 DATA 32,152,197,32,215,195,32,
   106'BDLG
60 DATA 196,76,187,192,32,215,195,
   32'BDBI
70 DATA 106,196,173,124,199,141,125,
   199'BGWJ
80 DATA 32,221,193,32,243,193,32,
   112'BDAJ
90 DATA 195,32,72,193,32,115,193,
   32'BCPK
100 DATA 155,193,206,125,199,173,125,
    199'BGBB
110 DATA 208,239,32,88,192,32,102,
    194'BDUB
120 DATA 32,88,192,32,228,255,240,
    6'BBTC
130 DATA 141,167,199,32,8,193,173,
    157'BDAE
140 DATA 199,240,3,76,166,192,173,
    141'BDYE
150 DATA 2,201,1,208,189,76,112,
    192'BBIF
160 DATA 238,155,199,173,155,199,208,
    248'BGMH
170 DATA 238,156,199,173,156,199,201,
    9'BEGI
180 DATA 208,238,169,0,141,156,199,
    96'BDCJ
190 DATA 162,0,189,77,199,157,65,
    6'BAMJ
200 DATA 169,1,157,65,218,232,224,
    5'BBRB
210 DATA 208,240,169,0,141,24,212,
    173'BDBC
220 DATA 141,2,208,251,162,0,189,
    82'BBID
230 DATA 199,157,65,6,169,13,157,
    65'BBNE
240 DATA 218,232,224,5,208,240,169,
    143'BEEG
250 DATA 141,24,212,76,18,192,32,
    184'BCMG
```

```
260 DATA 195,32,227,192,169,128,141,
    27'BESI
270 DATA 208,169,14,141,46,208,169,
    159'BEVJ
280 DATA 141,21,208,162,0,189,68,
    199'BCWJ
290 DATA 157,63,6,169,1,157,63,
    218'BAAK
300 DATA 232,224,9,208,240,32,115,
    193'BDGC
310 DATA 32,243,193,32,88,192,32,
    88'BBBD
320 DATA 192,173,0,220,41,16,208,
    237'BCEE
330 DATA 76,12,192,169,15,141,24,
    212'BCKF
340 DATA 169,129,141,18,212,162,30,
    142'BEAH
350 DATA 15,212,142,46,208,32,88,
    192'BCOH
360 DATA 202,224,0,208,242,169,0,
    141'BCUI
370 DATA 24,212,169,128,141,18,212,
    96'BDOJ
380 DATA 173,167,199,201,133,208,5,
    162'BELL
390 DATA 65,76,57,193,201,134,208,
    5'BBUL
400 DATA 162,17,76,57,193,201,135,
    208'BDSD
410 DATA 5,162,33,76,57,193,201,
    136'BBQE
420 DATA 208,14,169,64,141,133,195,
    141'BEIG
430 DATA 138,195,141,185,195,141,190,
    195'BGWH
440 DATA 96,142,133,195,142,138,195,
    202'BFNI
450 DATA 142,185,195,142,190,195,96,
    96'BEGJ
460 DATA 173,0,220,201,127,240,248,
    201'BEKK
470 DATA 119,208,14,173,14,208,201,
    254'BEZL
480 DATA 240,237,238,14,208,238,14,
    208'BEHM
490 DATA 96,201,123,208,13,173,14,
    208'BDFM
500 DATA 201,78,240,6,206,14,208,
    206'BCEE
510 DATA 14,208,96,162,0,254,1,
    208'BAIF
520 DATA 232,232,224,10,208,247,162,
    0'BDVG
530 DATA 189,1,208,240,7,232,232,
    224'BCHH
540 DATA 10,208,245,96,32,147,193,
    157'BDVI
550 DATA 0,208,96,173,27,212,201,
    80'BBGJ
560 DATA 144,249,96,238,11,208,238,
    13'BDWK
570 DATA 208,173,11,208,208,23,32,
    147'BDGL
580 DATA 193,141,10,208,173,21,208,
    41'BDAM
590 DATA 32,208,38,24,173,21,208,
    105'BCFN
600 DATA 32,141,21,208,96,173,13,
    208'BCHF
610 DATA 208,22,32,147,193,141,12,
    208'BDEG
620 DATA 173,21,208,41,64,208,10,
    24'BBBH
630 DATA 173,21,208,105,64,141,21,
    208'BDAI
640 DATA 96,32,14,195,96,32,80,
    194'BAEJ
650 DATA 173,255,7,201,227,240,6,
    169'BCPK
660 DATA 227,141,255,7,96,169,228,
    141'BDBL
670 DATA 255,7,96,238,162,199,173,
    162'BDGN
680 DATA 199,201,2,208,149,160,0,
    140'BCDN
690 DATA 162,199,174,117,199,189,93,
    199'BFXP
700 DATA 153,24,49,174,118,199,189,
    93'BDKH
710 DATA 199,153,32,49,174,119,199,
    189'BEOI
720 DATA 93,199,153,40,49,238,117,
    199'BDJJ
730 DATA 238,118,199,238,119,199,200,
    192'BGDK
740 DATA 8,208,215,173,117,199,201,
    24'BDPK
750 DATA 208,5,169,0,141,117,199,
    173'BCTL
760 DATA 118,199,201,24,208,5,169,
    0'BBOM
770 DATA 141,118,199,173,119,199,201,
    24'BFQO
780 DATA 208,27,169,0,141,119,199,
    96'BCEO
790 DATA 238,253,7,238,254,7,173,
    254'BCBP
800 DATA 7,201,227,208,8,169,224,
    141'BCMH
810 DATA 253,7,141,254,7,96,173,
    30'BARI
820 DATA 208,240,250,141,166,199,201,
    160'BGAK
830 DATA 208,17,169,223,141,21,208,
    169'BEJL
840 DATA 0,141,166,199,141,30,208,
    32'BCFL
850 DATA 164,194,96,173,166,199,201,
    192'BFEN
860 DATA 208,17,169,191,141,21,208,
    169'BENO
870 DATA 0,141,166,199,141,30,208,
    32'BCFO
880 DATA 164,194,96,32,47,195,169,
    0'BBHP
```

```
890 DATA 141,30,208,96,238,163,199,
     173'BEUR
900 DATA 163,199,201,20,208,11,169,
     0'BCFI
910 DATA 141,163,199,238,124,199,32,
     250'BFRK
920 DATA 194,238,181,5,173,181,5,
     201'BCOK
930 DATA 186,240,1,96,169,176,141,
     181'BDYL
940 DATA 5,238,180,5,173,180,5,
     201'BAHM
950 DATA 186,240,1,96,169,176,141,
     180'BDXN
960 DATA 5,238,179,5,173,179,5,
     201'BAXO
970 DATA 186,240,1,96,169,176,141,
     179'BDBQ
980 DATA 5,238,178,5,173,178,5,
     201'BAVQ
990 DATA 186,240,1,96,169,176,141,
     178'BDAS
1000 DATA 5,96,238,164,6,173,164,
     6'BYCX
1010 DATA 201,186,240,1,96,169,176,
     141'BDRY
1020 DATA 164,6,238,163,6,96,238,
     159'BBJA
1030 DATA 199,173,159,199,201,25,208,
     3'BDDB
1040 DATA 238,157,199,238,148,7,173,
     148'BEKD
1050 DATA 7,201,186,240,1,96,169,
     176'BBWD
1060 DATA 141,148,7,238,147,7,96,
     238'BBGE
1070 DATA 126,199,173,126,199,201,4,
     208'BERG
1080 DATA 17,56,173,84,195,233,8,
     141'BBYG
1090 DATA 84,195,169,255,141,126,199,
     76'BEKI
1100 DATA 47,195,174,126,199,189,120,
     199'BFMA
1110 DATA 141,88,195,162,40,160,0,
     169'BCQA
1120 DATA 84,157,48,49,232,200,192,
     8'BBYB
1130 DATA 208,245,238,161,199,173,161,
     199'BGDD
1140 DATA 201,24,208,3,238,157,199,
     96'BCAD
1150 DATA 238,158,199,173,158,199,201,
     2'BEDF
1160 DATA 208,245,169,0,141,158,199,
     173'BEUG
1170 DATA 160,199,208,52,169,65,141,
     4'BCXG
1180 DATA 212,169,33,141,11,212,174,
     164'BEWI
1190 DATA 199,189,168,199,170,189,141,
     199'BGBJ
1200 DATA 141,0,212,189,127,199,141,
     1'BCIA
1210 DATA 212,174,164,199,189,232,199,
     170'BGDC
1220 DATA 189,141,199,141,7,212,189,
     127'BEWD
1230 DATA 199,141,8,212,238,160,199,
     96'BDDE
1240 DATA 169,64,141,4,212,169,32,
     141'BCLE
1250 DATA 11,212,238,164,199,173,164,
     199'BFWG
1260 DATA 201,64,208,5,169,0,141,
     164'BBGG
1270 DATA 199,169,0,141,160,199,96,
     162'BDCI
1280 DATA 0,138,157,0,56,157,0,57'BXSH
1290 DATA 232,224,0,208,245,162,0,
     189'BCGJ
1300 DATA 33,198,157,0,56,189,50,
     198'BBJB
1310 DATA 157,64,56,189,67,198,157,
     128'BDSD
1320 DATA 56,232,224,17,208,233,162,
     0'BCED
1330 DATA 189,84,198,157,192,56,157,
     0'BCPE
1340 DATA 57,232,224,53,208,242,162,
     0'BCFF
1350 DATA 189,137,198,157,64,57,232,
     224'BEFH
1360 DATA 63,208,245,169,44,141,49,
     57'BCDH
1370 DATA 169,12,141,52,57,162,0,
     189'BBQI
1380 DATA 217,197,157,0,208,232,224,
     47'BDRJ
1390 DATA 208,245,162,0,189,8,198,
     157'BCFK
1400 DATA 0,212,232,224,25,208,245,
     162'BDXC
1410 DATA 0,138,157,155,199,232,224,
     12'BDOD
1420 DATA 208,248,162,0,169,85,157,
     48'BCFE
1430 DATA 49,232,224,48,208,246,162,
     0'BCOF
1440 DATA 189,232,199,157,248,199,157,
     8'BETH
1450 DATA 200,157,24,200,232,224,16,
     208'BEOI
1460 DATA 239,96,169,153,32,210,255,
     169'BEXJ
1470 DATA 147,32,210,255,162,0,169,
     160'BDFJ
1480 DATA 157,0,4,157,0,5,157,0'BVJJ
1490 DATA 6,157,232,6,232,224,0,
     208'BAEL
1500 DATA 239,169,7,141,160,196,169,
     4'BCED
1510 DATA 141,161,196,169,0,141,165,
     199'BEQF
1520 DATA 162,0,160,0,189,200,198,
     153'BCGF
1530 DATA 7,4,232,200,192,25,208,
     244'BBEG
1540 DATA 224,75,208,2,162,0,24,
     173'BAFH
```

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by Mike Rivers

Introducing Amiga CLI

In the first of a series of articles about the Amiga, Technical Editor Mike Rivers introduces the Command Line Interface.



ART BAXTER

CLI stands for "Command Line Interface" and is the keyboard-intensive command-oriented operating system on the Amiga. For those of you who have used a 64, CLI is where you would do the sort of disk operations you've come to know and love. Reading disk directories, formatting blank disks, copying disks and files, plus a host of other operations can all be done from the CLI.

Your next question is probably, "Where is the CLI? I don't see it when Workbench boots." The CLI is usually tucked away somewhere, you must turn it "on" to use it. Once you have booted Workbench, click twice on the Workbench disk icon with the mouse pointer to open it. Double click the system drawer icon to open it. If your system drawer already contains the CLI icon, just double click on it to open the CLI. Afterwards, you may want to resize it to fill the screen by using the drag bar and the resizing gadget.

If you do not see the CLI icon, use the following procedure to turn it on:

1. Double click the Preferences icon in the Workbench window to open the Preferences screen.
2. Just above the "reset colors" box, you'll see the "CLI ON/OFF" switch. Set the switch to "on" by clicking the "on" box. The word "on" should now be highlighted.
3. Click the "save" box on the lower right of the screen to save the settings.
4. Once they have been saved, open the Preferences screen again and click the "use" box which is located below the "save" box.
5. When you return to the Workbench screen, close the system drawer and re-open it. You should see the CLI icon in the system drawer window, represented by a picture of a window with the "1>" prompt in it.
6. Click on the CLI icon twice and the CLI window will open.

At this point, it's a good idea to write protect your Workbench disk by removing it from the drive and sliding the write-protect tab into the write-inhibit position. That is, you should be able to see through the square hole in the corner of the disk.

Now you are ready to use the CLI. Let's start by looking at the Workbench disk directory. Unless you've moved it, the Workbench disk is probably in the drive designated DF0: which is the internal drive on the 1000 and 500 models and the first internal floppy installed on the 2000 (normally found on the right, unless you got fancy with the installation procedure like some people I know, who just *have* to be different). So, lets start by typing DIR <RETURN> next to the CLI prompt. AmigaDOS lists all the directories on the disk and any files in the "root" directory (that is, any files which are not in sub-directories). You may be expecting to see a single directory on the screen, but AmigaDOS allows for multiple "nested" directories and files. You can place sub-directories within directories and files within sub-directories by specifiying a destination "path" when you save or copy files. As it is, the current "stock" Workbench disk for the 500/2000 shows 13 directories and 12 files in the root directory when you type DIR in the CLI. You can tell AmigaDOS to show you all the files and all the directories on the disk by typing: DIR OPT A <RETURN>. This stands for "directory option A." You can also get AmigaDOS to pause and prompt you with a question mark after each directory or file by adding the letter "I" next to the "A." To see the next item, press RETURN. This stands for "directory option A, *interactive* mode." The "I" may be used with the "A" option or by itself.

There are two other commands you can use to help you get information about your disks, they are INFO and LIST. Type INFO and press the RETURN key. The CLI window lists information about the disks in the drives, their capacities, identities and statuses. Type LIST <RETURN> to get information about the files and directories within the current directory. The first field shows the name of the file or directory, the next one shows the size of the file in bytes, the third one shows the protection status ("RWED" signifies Read, Write, Execute and Delete), the fourth one shows date and time of the file's creation, and finally there is a comment field for comments placed on the file using the FILENOTE command.

Let's roam around the directory hierarchy a bit to get a feel for it.

The command CD stands for "current directory" and is used for setting the current directory or drive. Typing CD alone will display the name of the current directory. If you want to look at a disk in another drive, type the command CD followed by a space and then the name of the drive. For example:

CD DF0: <RETURN>

will set the current device or directory to df0:. This will also return you to the topmost directory level. To look at the command library called "C" type: CD C <RETURN>. After a moment the CLI prompt will reappear. Type DIR <RETURN> and the contents of the "C" directory will scroll up the screen. To stop scrolling, press the spacebar. To resume scrolling, press the backspace key (located directly above the RETURN key). To return to the next highest directory level type: CD /. (Do that now before we move on.) Next, let's look at a directory within a directory.

The device directory is called "devs." It contains three sub-directories: keymaps, printers and clipboards. You can view any of the three sub-directories in devs from the root directory by specifying a path through the directories. For example,

type: DIR DEVS/PRINTERS <RETURN> to list printer drivers on the screen. Now type: DIR DEVS/KEYMAPS <RETURN> to list keymaps in the keymaps sub-directory to the screen.

Now lets actually go into a directory and run a program there. Type CD DEMOS and press the RETURN key to get into the demos directory. Type DIR <RETURN> to see the contents of demos. Here you will see the four demos entitled "Boxes," "Dots," "Lines" and "Spots." You also see duplicate filenames with ".info" attached to the end. These are the files that contain the icon information for each program. My favorite is "Lines," so let's type LINES <RETURN> at the CLI prompt. A window will open with the Lines demo runnning in it. Now you'll notice that the CLI window isn't active. It won't be, until you close the demo window by clicking on the close gadget with the mouse pointer. This time type RUN LINES <RETURN>. "CLI 2" appears in brackets below the command line, the Lines demo window opens, then the CLI prompt reappears. The "CLI 2" tells you that AmigaDOS has started a new CLI "task." You can type more commands now while the Lines demo is running.

Try typing: RUN BOXES <RETURN>. The DOS says that it is starting a new task and opens the Boxes demo window. Now if you type STATUS <RETURN> on the command line AmigaDOS responds by listing the processes or tasks that are running.

Congratulations! Your Amiga is multitasking! Okay, okay, let's calm down now and close the demo windows. Whew, that was exciting, wasn't it? Now let's get down to some disk operations.

The FORMAT command is found in the system directory. Type: CD DF0:SYSTEM <RETURN> to get to the system directory. Just for practice, type DIR <RETURN> to convince yourself that "format" is really there. Put a blank, unformatted disk, or one you want to erase, in DF1: and type: FORMAT DRIVE DF1: NAME "MYDISK" <RETURN>. AmigaDOS will prompt you with: "Insert disk to be initialized in drive DF1: and press RETURN."

For those of you who have one drive, type: FORMAT DRIVE DF0: NAME "MYDISK". Press the RETURN key, and AmigaDOS will prompt you to insert the disk to be initialized in drive DF0:. Remove any disks in the drive you are going to use and place the disk you want to format in the drive, making sure that it is not write protected. Press the RETURN key, and AmigaDOS shows which cylinder and head is being formatted. Do not remove the disk until the window closes, or the disk will not be properly initialized.

At this point I'd like to mention two important features of AmigaDOS. When you type in commands and get them a little wrong, AmigaDOS will remind you of the proper usage. Try typing in the FORMAT command without the NAME segment at the end. The DOS will respond with "Usage:" followed by the correct template for the command. When something goes wrong, you can actually ask the computer why. Try using the FORMAT command while in the "demo" directory. The DOS tells you the command is unknown. For a further explanation, type WHY. Pretty neat, eh? A similar thing can be done if you encounter one of the three-digit error messages by typing "fault" and the three digits of the error message. Fairly conversational for a personal computer, don't you think?

Suppose you're doing some disk housekeeping and you decide you'd really rather have the FORMAT command in your "C" directory. Write enable your Workbench disk by removing it from the drive and sliding the write-protect tab into the tab window so that you can see through the square hole in the corner of the disk. Type: COPY DF0:SYSTEM/FORMAT TO DF0:C <RETURN>. As you can see, we specified the path through the directory using the slash (/) to separate the directory and filename. Then we specified the destination. COPY is a particularly flexible command, so you should refer to your system guide for more details on different ways to use it.

To put your disk back to its original form, delete the FORMAT command from the "C" directory by typing: DELETE DF0:C/FORMAT. As always, be careful with DELETE and COPY.

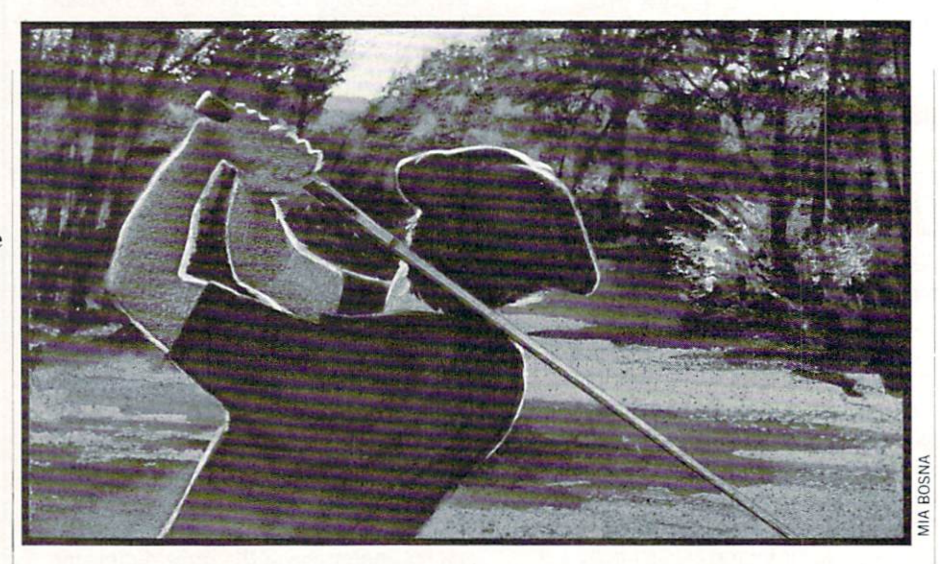
You can copy entire disks using COPY, or you can use the DISKCOPY command. To back up a disk using a single drive, type: DISKCOPY FROM DF0: TO DF0:. AmigaDOS will prompt you when it wants you to change disks. With two drives you can change one of the drive designations to the external drive and copy in either direction.

So there's an overview of how to use the fundamental CLI commands. I recommend getting an AmigaDOS manual and reading it thoroughly, since it's the best way to get a feel for the power and flexibility of AmigaDOS. In the meantime, experiment! C

by Michael J. Poltonavage

Golf

for the Commodore 64 and 128



MIA BOSNA

The weatherman says Saturday will be a beautiful day, so you call for a tee-time at your favorite course. You luck out and get a time you like—not too early and not too late. You also have three others (not two or four), so your group is all set. Saturday comes, and it rains. A real downpour—not just a drizzle you could play through. Now what? With this program and your Commodore 64 or 128 you're all set. The "Tanglewood Country Club," a simulated all-text golf course awaits you.

The course is 6785 yards long with a par of 72 and has rough, bunkers, woods and, of course, water. There are fourteen clubs available for you: 1 through 3 woods, 2 through 9 irons, pitching wedge, sand wedge and putter. The game allows one to four players and is relatively simple to play.

The program tells you how far you are from the hole and whether you are in the fairway, rough, etc. You enter your club selection by using a two-digit code. The woods are selected by entering the number and "W," as in "1W" for the driver. The irons are similar, "4I" is for a 4-iron. "PW" is for pitching wedge and "SW" for sand wedge. When using these last two clubs you are asked whether you want to swing one-third, two-thirds or full. This is to allow more accuracy with these clubs while still having a larger range of use than the regular irons. The range of the club is split in thirds. For example, the PW with a two-thirds swing will probably go 67-84 yards. You can only use the putter when you are on the green, and you enter a number from 1–7 for the strength of the stroke. The program shows everyone's score at the end of each hole and at the end of the round.

There are not specific trouble spots on the course. There is a random generator that determines whether you get in trouble or not. If you do, another random number determines what kind. One-third of the time you will be in the rough, one-third in bunkers, one-sixth in the woods, and one-sixth in the water. There are three kinds of water (pond, lake and creek) just to add variety. If you get in the woods, there is a slight chance that the ball will bounce back into the fairway. If the "caddy" ever gives you a hint, listen to him, because he knows the course.

There are a number of other features built into the program, and some "tuning" has been done to make the game more realistic. For instance, you shouldn't use a driver off of the fairway. But you can use a sand wedge from the fairway (that was needed to adequately cover the 0-100 yard range). When you are in the rough or a bunker, the ball generally will not go as far as the club's normal range. The longer clubs will be affected more than the shorter ones. There are easy and difficult holes. The first par-3, number 3 at 152 yards is fairly easy. Number 15, a par-4 of 434 yards with a narrower fairway than most holes that length, is difficult. Some of the par-5's are reachable in two, and one, #13 at 614 yards definitely isn't.

The accuracy of your shot is determined by a random number and a logarithm. The logarithm was used to give a range of values with a higher percentage of shots being farther from the hole (which probably matches your experience). The accuracy is also then affected by what club you are using. Also, one-fifth of the shots will fall outside of the expected range with most of those being short. The pitching and sand wedges are more accurate than the other irons. The driver is less accurate than the shorter woods and irons. When hitting to the green with the fairway woods and wedges, the random number generator is used twice and the more "appropriate" number is then used. On the short par 4's you might consider using a 2 or 3 wood, because the fairways are tighter than the longer holes. That means you are more likely to miss the fairway and get into trouble which may be of any type. On each par-4 or par-5 you are told basically how wide the fairway is. Next to the number of yards, either "NARROW-FW," "MEDIUM-FW" or "WIDE-FW" will be printed. You can, of course, drag out the "cannon" on a short hole (like number 1, which is 301 yards) and perhaps not only stay in the fairway, but also get to the green (yes, I did reach it once, and made the eagle putt).

Putting can also pose problems. Entering a 1 will stroke the ball 1-10 feet, and entering a 7 will hit it 61-70 feet. After that random numbers are used again. You don't need to hit it the exact length to drop the putt. That would have made for many 3- and 4-putt greens. Making a putt under ten feet is easier than making a 20-footer even though the range of possible distances for both is ten feet. And putts under seven feet were made easier by three-fourths of the misses being counted as going in. However, it is still possible to miss a very short putt, three-putt, or to hang any putt on the lip. Sinking anything over 25 feet is also set to be a little more difficult than simply getting the right random number in a range of ten. One-fifth of those that would have made it are adjusted to miss. You can also "go for it" or "lag up." For example, if you are 21 feet away, entering a "2" almost certainly won't make the putt but will get you close. Entering a "3" gives you a better chance, but also a better chance of missing by more.

It is also possible to hit the pin, or to hole the shot from off the green, or even to get a hole-in-one. It is not very easy. But perhaps easier than in real golf. I hope you have fun playing Golf. I have had fun fine-tuning it. C

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Golf

```
10 GOTO 1370'BEIX
20 REM  GOLF'BEHY
30 REM ** ACCURACY SUBR **'BQOD
40 Z=RND(0):Z2=INT(54*Z)+1
   :AC=INT(3*LOG(Z2))-1'LYRM
50 IF AC<0 THEN AC=0'EGEE
60 RETURN'BAQC
70 REM  **   DISTANCE SUBR **'BQOH
80 Z=RND(0):X=20:A=0:ODL=DL'FRPL
90 IF CL=12 OR CL=13 THEN 130'FLPK
100 IF CL=1 THEN X=80'EGWY
110 IF (CL=2 OR CL=3) THEN X=30'GLJC
120 GOTO 210'BDCX
130 PRINT:PRINT"1/3, 2/3, OR FULL (1,
     2, OR 3)";:X=17'DGYH
140 GET A$:IF A$="" THEN 140'EIED
150 IF A$="1" THEN 190'DFVD
160 IF A$="2" THEN A=17:GOTO 190'FJBG
170 IF A$="3" THEN A=34:GOTO 190'FJBH
180 GOTO 140'BDEE
190 PRINT A$;'BDGF
200 REM  SAND/ROUGH MORE DIFF LONGER
    CLUB'BDLE
210 IF (PL=1 OR PL=4 OR PL=5 OR PL=6)
    AND CL<6 THEN DF=.8*DF'NXDL
220 IF (PL=1 OR PL=4 OR PL=5 OR PL=6)
    AND CL<3 THEN DF=.7*DF'NXYM
230 DI=INT(DF*(MR(CL)+(X*Z)+A+1))'HUFI
240 REM  ALTER DIST HIT OUTSIDE OF
    RANGE'BBMI
250 Z=RND(0):X=INT(5*Z)+1
    :IF X<>4 THEN 290'KRIL
260 Z=RND(0):X=INT(3*Z)+1
    :IF X=2 THEN 280'JRGL
270 DI=INT(.9*DI):GOTO 290'EMQI
280 DI=INT(1.1*DI):GOTO 290'ENHJ
290 RETURN'BAQF
300 REM ** TROUBLE TYPE SUBR **'BTJC
310 Z=RND(0):PL=INT(6*Z)+1'GMLE
320 RETURN'BAQY
330 REM ** TROUBLE SUBR **'BPSE
340 DF=1'BDIC
350 ON PL GOTO 370,430,470,620,370,
    620'CAOI
360 REM  ROUGH'BFUF
370 Z=RND(0):IF ((INT(2*Z)+1)=1) THEN
    400'ISEM
380 PRINT:PRINT"YOUR BALL IS IN THE
    RIGHT ROUGH"'CBWO
390 PRINT DL;"YARDS FROM THE PIN"
    :DF=.9:TR=1:GOTO 680'EQHR
400 PRINT:PRINT"YOUR BALL IS IN THE
    LEFT ROUGH"'CBNH
410 PRINT DL;"YARDS FROM THE PIN"
    :DF=.9:TR=1:GOTO 680'EQHK
420 REM  WATER'BFSC
430 Z=RND(0):WA=INT(3*Z)+1:PRINT
    :PRINT WA$(WA)'IVXL
440 DL=DL+10:PRINT"AFTER DROPPING
    BACK IT'S":PRINT DL;
    "YARDS FROM THE PIN"'ELXS
450 SR(I)=SR(I)+1:GOTO 680'DPHI
460 REM  WOODS'BFBG
470 Z=RND(0):WO=INT(10*Z)+1
    :IF WO<>7 THEN 510'KUAQ
480 PRINT:PRINT"AREN'T YOU THE LUCKY
    ONE. YOUR BALL HIT"'CBJR
490 PRINT"A COUPLE OF TREES AND THEN
    BOUNCED INTO"'BAUR
500 PRINT"THE FAIRWAY ";DL;
    "YARDS FROM THE GREEN"
    :GOTO 680'CIIK
510 Z=RND(0):WO=INT(3*Z)
    :IF WO<>1 THEN 560'JSPK
520 DL=ODL:LO=1:SR(I)=SR(I)+1'EVEJ
530 PRINT:PRINT"THAT ONE'S LONG GONE.
    YOU MIGHT AS WELL"'CBON
540 PRINT"NOT EVEN LOOK FOR IT. YOUR
    BALL IS "'BAQM
550 PRINT DL;"YARDS FROM THE PIN
    AGAIN":GOTO 680'CHFN
560 TR=1:PRINT:PRINT"YOUR BALL IS ";
    DL;"YARDS FROM THE PIN"'DJVR
570 PRINT"BEHIND SOME TREES,
     AND IN A BAD LIE. "'BANP
580 PRINT"TRY TO CHIP IT BACK INTO"
    :PRINT"INTO PLAY WITH A PITCHING
    WEDGE"'CBDX
590 PW$="Y"'BDOJ
600 GOTO 680'BDNB
610 REM  SAND'BEFC
620 TR=1:IF DL<=50 THEN 660'FLJH
630 PRINT:PRINT "YOU ARE IN A BUNKER";
    DL;"YDS FROM THE PIN"'CFFO
640 Z=RND(0):T=INT(Z*10)
    :IF T=4 THEN DF=1:GOTO 680'KVEP
650 Z=RND(0):DF=INT(Z*6)/10+.3
    :GOTO 680'ITVO
660 PRINT:PRINT"YOU ARE IN A GREEN
    SIDE BUNKER":PRINT DL;
    "YDS FROM THE PIN"'DFSV
670 Z=RND(0):DF=INT(Z*5)/10+.5'HPAP
680 RETURN'BAQI
690 REM ** CHOOSE CLUB SUBR **'BSOO
700 PRINT"WHICH CLUB ?";'BBUE
710 GET A$:IF A$="" THEN 710'EIHG
720 IF(A$>="1"AND A$<="9")OR A$="P"OR
    A$="S"OR A$="C"THEN PRINT A$;
    :GOTO 740'PTFS
730 GOTO 710'BDHF
740 GET B$:IF B$="" THEN 740'EIMJ
750 PRINT B$;:IF ASC(B$)=20 OR
    ASC(B$)=157 THEN GOTO 710'JULP
760 IF B$="W" AND (A$>="1" AND
    A$<="3") THEN CL=ASC(A$)-48
    :GOTO 820'NUVU
770 IF B$="I" AND (A$>="2" AND
    A$<="9") THEN CL=ASC(A$)-48+2
    :GOTO 820'OVDW
780 IF A$+B$="PW" THEN CL=12
    :GOTO 820'GMDQ
790 IF A$+B$="SW" THEN CL=13
    :GOTO 820'GMHR
```

```
800 IF A$+B$="CL" THEN GOSUB 1900
    :GOTO 700'GMEI
810 PRINT:PRINT"[UP]";BL$;"[UP]";
    :GOTO 700'DLBI
820 SR(I)=SR(I)+1'CLLI
830 IF CL<>1 OR (SR(I)<2 OR LO=1)
    THEN 880'IRWO
840 REM   PREVENT DRIVER OFF
    FAIRWAY'BXIN
850 Z=RND(Ø):DL=DL-(INT(17*Z)+1)'HRIP
860 PRINT:PRINT"A DUFF. YOUR BALL IS
    NOW";DL;"YARDS":PRINT"FROM THE
    HOLE."'DGVW
870 PRINT"EVEN THE PROS DON'T TRY
    THAT ONE.":GOTO 700'CENT
880 IF PW$<>"Y" OR CL=12 THEN 930'GKUQ
890 REM   SHOULD HAVE FOLLOWED
    CADDIE'BYTS
900 DL=DL+13:PRINT:PRINT"NICE JOB -
    IT BOUNCED OFF OF A TREE."'EIQQ
910 PRINT"NOW YOUR'RE IN THE FAIRWAY"
    :PRINT DL;"YARDS FROM THE
    PIN"'CEUS
920 SR(I)=SR(I)+1:PW$="N"
    :GOTO 700'ETGM
930 PW$="N":RETURN'CEWI
940 REM ** PUTTING SUBR **'BPHL
950 DL=DL*3:IF TR=1 THEN
    AC=AC*1.25'HRJQ
960 REM IF CL>11 AND DL>Ø AND TR=Ø
    THEN 803'BDFQ
970 DL=INT((DL^2+AC^2)^Ø.5)'GPMR
980 IF AC<3 AND ABS(DL)<10 THEN PRINT
    :PRINT:PRINT"NICE SHOT - IT HIT
    THE PIN !"'JLEB
990 IF DL>1 THEN 1030'DHDP
1000 Z=RND(Ø):X=INT(Z*7)+1'GLTY
1010 IF X=3 THEN PRINT:PRINT"TOO BAD
     - YOUR BALL IS ON THE LIP"
     :GOTO 1040'GICH
1020 PRINT:PRINT"YOUR BALL IS 1 FOOT
     FROM THE HOLE":GOTO 1040'DGDG
1030 PRINT:PRINT"YOUR BALL IS";DL;
     "FEET FROM THE HOLE"'CFUG
1040 PRINT"PUTTING STROKE (1-7)";'BBPD
1050 GET A$:IF A$="" THEN 1050'EJDC
1060 PRINT A$;:P=ASC(A$)-48
     :IF P<1 OR P>7 THEN PRINT
     :GOTO 1040'LVBK
1070 SR(I)=SR(I)+1'CLLE
1080 Z=RND(Ø):DI=INT(10*Z)+(P-1)
     *10+1'JTKL
1090 IF DL<2 AND P=1 THEN 1220'FJCH
1100 IF DL<10 AND ABS(DL-DI)>4 AND
     P<2 THEN 1080'JRED
1110 IF DL>6 OR ABS(DL-DI)<4 THEN
     1130'HOLC
1120 Z=RND(Ø):X=INT(4*Z)+1
     :IF X<>3 THEN DI=DL'LSIH
1130 IF DL<26 OR ABS(DL-DI)>3 THEN
     1150'HPHF
1140 Z=RND(Ø):Z2=INT(7*Z)+1
     :IF Z2<>2 THEN Z=RND(Ø)
     :DL=INT(15*Z)+1:GOTO 1160'RJIR
1150 DL=DL-DI:IF ABS(DL)<4 THEN
     1220'GQJG
1160 IF DI<15 THEN PRINT
     :PRINT"DRIBBLE...":GOTO 1180'GKNI
1170 PRINT:PRINT"DRIBBLE..TRICKLE.."'
     CBFH
1180 IF DL>Ø THEN DL=DL-2
     :GOTO 990'GMHI
1190 DL=DL+2'CFXF
1200 IF DL=-1 THEN PRINT
     :PRINT"TOO MUCH-YOU SLID BY 1
     FOOT";:DL=-DL:GOTO 1020'JPXL
1210 PRINT:PRINT"TOO MUCH-YOU SLID
     BY";:DL=-DL: PRINT DL;"FEET";
     :GOTO 1030'GRCK
1220 IF DI<6 THEN PRINT
     :PRINT"...PLUNK":GOTO 1260'GJME
1230 IF DI<15 THEN PRINT
     :PRINT"TRICKLE...PLUNK"
     :GOTO 1260'GKBI
1240 IF DI<25 THEN PRINT
     :PRINT"DRIBBLE..TRICKLE..PLUNK"
     :GOTO 1260'GKSL
1250 PRINT:PRINT"SQUIGGLE..DRIBBLE..T
     RICKLE..PLUNK"'CBQK
1260 PRINT"IN THE HOLE"'BAEE
1270 RETURN'BAQC
1280 DATA 4,8,11,15,20,24,27,32,36,40,
     43,47,52,56,60,63,68,72'BBEN
1290 DATA 301,347,152,407,485,390,212,
     515,337'BKGL
1300 DATA 385,179,420,614,414,432,225,
     530,440'BKED
1310 DATA 4,4,3,4,5,4,3,5,4,4,3,4,5,4,
     4,3,5,4'BKXE
1320 DATA 20,22,18,20,27,20,21,25,21,
     23,15,23,28,22,23,20,18,19'BDSI
1330 DATA 20,20,20,25,30,25,10,30,20,
     23,20,25,30,30,30,20,30,28'BDNJ
1340 DATA 210,200,180,170,160,150,140,
     130,120,110,100,50,Ø'BXMJ
1350 DATA 210-290,200-230,180-210,
     170-190,160-180,150-170,140-160,
     130-150'BNIN
1360 DATA 120-140,110-130,100-120,
     50-100,Ø-50'BKRJ
1370 PRINT"[CLEAR]":PRINT:PRINT
     :PRINT TAB(15)"[L. GREEN]
     GOLF"'FGHJ
1380 DIM CN$(14),NA$(4),YD(18),PA(18),
     GS(18),TP(18),MR(13),MR$(13),
     TS(4)'BNMR
1390 DIM PD(4),SR(4),FW(18),
     PM$(7)'BALK
1400 WA$(1)="YOUR BALL LANDED IN A
     CREEK"'BGYF
1410 WA$(2)="DO YOU HAVE SCUBA DIVING
     EQUIPMENT WITH YOU? ITS IN A
     POND"'BGOP
1420 WA$(3)="SPLASH! YOU'LL HAVE A
     HARD TIME FINDING IT - ITS IN A
     LAKE"'BGRP
1430 X=RND(TI):FOR I=1 TO 40
     :BL$=BL$+" ":NEXT'ISTJ
```

```
1440 PM$(1)="DOUBLE EAGLE!!"
     :PM$(2)="EAGLE!":PM$(3)="BIRDIE"
     :PM$(4)="PAR"'ECTR
1450 PM$(5)="BOGEY":PM$(6)="DOUBLE
     BOGEY":PM$(7)="TRIPLE BOGEY"'DUTQ
1460 FOR I=1 TO 18:READ TP(I):NEXT
     :FOR I=1 TO 18:READ YD(I)
     :NEXT'KXDO
1470 FOR I=1 TO 18:READ PA(I)
     :NEXT'FLWJ
1480 FOR I=1 TO 18:READ GS(I):NEXT
     :FOR I=1 TO 18:READ FW(I)
     :NEXT'KXTQ
1490 FOR I=1 TO 13:READ MR(I):NEXT
     :FOR I=1 TO 13:READ MR$(I)
     :NEXT'KYBR
1500 POKE 53280,5:POKE 53281,5'CPVC
1510 PRINT:PRINT"WELCOME TO THE
     TANGLEWOOD COUNTRY CLUB."'CBHL
1520 PRINT:PRINT"DO YOU WANT
     INSTRUCTIONS (Y/N)?"'CBKJ
1530 GET A$:IF A$="" THEN 1530'EJGF
1540 PRINT A$;:IF A$="N" THEN
     1760'EKQG
1550 PRINT"[CLEAR]":PRINT "WELCOME TO
     THE TANGLEWOOD COUNTRY CLUB,
     "'CBDP
1560 PRINT"A SIMULATED GOLF COURSE.
     [SPACE2]AVAILABLE "'BAIO
1570 PRINT"FOR YOU IS A FULL SET OF
     CLUBS "'BAHN
1580 PRINT"CONSISTING OF THE
     FOLLOWING, ALONG WITH"'BAQR
1590 PRINT"EXPECTED RANGES &
     SELECTION CODES.":PRINT'CBGR
1600 PRINT"[RVS]CLUB";TAB(8)"RANGE";
     TAB(15);"CODE";TAB(21)"CLUB";
     'ENCJ
1610 PRINT TAB(28);"RANGE";TAB(35);
     "CODE":PRINT"[RVOFF]"'EKUH
1620 FOR I=1 TO 3:PRINT STR$(I);
     "WOOD";TAB(7);MR$(I);TAB(15);
     STR$(I);"W":NEXT'JDMO
1630 FOR I=4 TO 6:PRINT STR$(I-2);
     "IRON";TAB(7);MR$(I);TAB(15);
     STR$(I-2);"I"'KEBQ
1640 NEXT:PRINT"[HOME,DOWN8]";
     :PRINT'DDDF
1650 FOR I=7 TO 11'DEJG
1660 PRINT TAB(20);STR$(I-2);"IRON";
     'EKNK
1665 PRINT TAB(27);MR$(I);TAB(35);
     STR$(I-2);"I":NEXT'GVOS
1670 PRINT TAB(20);" PW ";TAB(28);
     MR$(12);TAB(35);" PW"'EVDO
1680 PRINT TAB(20);" SW ";TAB(29);
     MR$(13);TAB(35);" SW"'EVLP
1690 PRINT:PRINT"THE COURSE IS 6785
     YDS. LONG WITH A PAR"'CBVT
1700 PRINT"OF 72, AND HAS PLENTY OF
     ROUGH, WATER,"'BAPK
1710 PRINT"TREES & BUNKERS. I WILL
     CADDIE FOR YOU"'BAKL
1720 PRINT"(AT A MODEST RATE) & I
     KNOW THE COURSE"'BADM
1730 PRINT"PRETTY WELL. AS IN A REAL
     GAME OF GOLF,"'BAXN
1740 PRINT"UNEXPECTED TRIUMPHS AND
     DISASTERS LAY "'BADP
1750 PRINT"AHEAD OF YOU. GOOD LUCK
     AND HAVE FUN!":PRINT'CBMP
1760 PRINT"NUMBER OF PLAYERS (1-4)";
     'BBSM
1770 GET A$:IF A$="" THEN 1770'EJML
1780 PRINT A$:IF A$<"1" OR A$>"4"
     THEN 1760'GLYO
1790 NP=ASC(A$)-48:FOR I=1 TO NP'GNMQ
1800 NA$(I)="":PRINT "PLAYER #";I
     :PRINT"WHAT IS YOUR NAME: ";'DLGM
1810 GET A$:IF A$="" THEN 1810'EJHG
1820 IF A$=CHR$(13) THEN PRINT
     :GOTO 1860'GLOI
1830 IF ASC(A$)<>20 THEN PRINT A$;
     :NA$(I)=NA$(I)+A$:GOTO 1810'JEGP
1840 IF LEN(NA$(I))>0 THEN GOSUB 3000
     :GOTO 1810'GSFM
1850 GOTO 1810'BEHH
1860 IF LEN(NA$(I))>12 THEN PRINT"USE
     NAME OF 12 CHARS OR LESS"
     :GOTO 1800'GPPU
1870 IF LEN(NA$(I))<1 THEN PRINT"MUST
     ENTER A NAME OR INITIAL"
     :GOTO 1800'GONW
1880 NEXT:PRINT"[CLEAR]"'CBHK
1890 GOTO 2010'BEAL
1900 PRINT:PRINT'CBHD
1910 REM'BARD
1920 PRINT"[RVS]WOODS[RVOFF]"'BAGG
1930 FOR T=1 TO 3:PRINT STR$(T);"W ";
     MR$(T):NEXT'GQUM
1940 PRINT "[UP4]";TAB(11) "[RVS]
     IRONS[RVOFF]":PRINT"[UP]";'DGFO
1950 FOR T=4 TO 8:PRINT TAB(16);
     STR$(T-2);"I ";MR$(T):NEXT'IVIR
1960 PRINT"[UP5]";'BBXL
1970 FOR T=9 TO 11:PRINT TAB(27);
     STR$(T-2);"I ";MR$(T):NEXT'IWHT
1980 PRINT TAB(28);"PW ";MR$(12)
     :PRINT TAB(28);"SW ";MR$(13)'EAVT
1990 RETURN'BAQL
2000 REM ** MAIN LOOP FOR EACH HOLE
     **'BXGA
2010 PRINT"[CLEAR]":FOR H=1 TO 18
     :FOR I=1 TO NP'HKWC
2020 DL=YD(H):SR(I)=0'COKA
2030 PRINT"[CLEAR]";:GOSUB 1920
     :PRINT"HOLE # ";H;" PAR";PA(H);
     YD(H);"YARDS";'DYUI
2040 IF PA(H)<4 THEN PRINT
     :GOTO 2080'FLED
2050 IF FW(H)<22 THEN PRINT"[SPACE2]
     NARROW-FW":GOTO 2080'FMTH
2060 IF FW(H)<29 THEN PRINT"[SPACE2]
     MEDIUM-FW":GOTO 2080'FMCI
2070 PRINT"[SPACE4]WIDE-FW"'BATE
2080 PRINT"PLAYER #";I;NA$(I)'BJMG
2090 DF=1:PL=0:TR=0'DLFH
2100 GOSUB 700'BDKV
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```
2110 GOSUB 80:GOSUB 40'CFGX
2120 IF CL=1 THEN AC=AC*3'FIKC
2130 IF CL=2 THEN AC=INT(AC*2.5)'GMPE
2140 IF CL=3 THEN AC=INT(AC*2)'GKRF
2150 IF CL>3 AND CL<8 THEN
     AC=INT(AC*1.5)'IPFI
2160 LO=0:DL=DL-DI'DKRF
2170 IF DL<>0 THEN 2230'EHDG
2180 IF AC>3 THEN 2220'DHUG
2190 IF SR(I)<>1 THEN 2210'EKCI
2200 PRINT"[CLEAR]":PRINT:PRINT
     :PRINT"H O L E[SPACE3]I N[SPACE3]
     O N E[SPACE2]!!!!":GOTO 2400'FIDG
2210 PRINT:PRINT:PRINT"NICE[SPACE2]
     S H O T!!":PRINT"ITS IN THE HOLE
     !":GOTO 2400'FIFJ
2220 PRINT:PRINT:PRINT"NICE SHOT -
     PIN HIGH":GOSUB 950
     :GOTO 2400'FLCI
2230 IF ABS(DL)>GS(H) OR CL>3 THEN
     2270'GQEG
2240 REM  MAKE 2- & 3- WOOD LESS
     ACCURATE WHEN HITTING GREEN'BQEM
2250 T=DL:DL=ODL:GOSUB 80:GOSUB 40
     :DL=DL-DI'GWRK
2260 IF ABS(T)>ABS(DL) THEN DL=T'GKGI
2270 IF CL<12 THEN 2310'DIGG
2280 REM MAKE WEDGES MORE
     ACCURATE'BWFK
2290 T=DL:DL=ODL:Z=RND(0):GOSUB 210
     :GOSUB 40:DL=DL-DI'IDJR
2300 IF ABS(T)<ABS(DL) THEN DL=T'GKID
2310 IF DL>0 THEN 2340'DHHB
2320 DL=-DL:IF DL<GS(H) THEN GOSUB 950
     :GOTO 2400'HUTI
2330 PRINT:PRINT"TOO MUCH."
     :PRINT"YOU OVERSHOT THE HOLE BY";
     DL;"YARDS";'DHSO
2340 IF DL<GS(H) THEN GOSUB 950
     :GOTO 2400'FPQH
2350 Z=RND(0):DE=INT(5*Z)+1'GMQI
2360 IF AC>FW(H) OR DE=4 THEN GOSUB
     310:GOSUB 340:GOTO 2100'IWRM
2370 IF DL<=GS(H) THEN GOSUB 950
     :GOTO 2400'GPOL
2380 PRINT:PRINT"YOUR BALL IS IN THE
     FAIRWAY":PRINT DL;
     "YARDS FROM THE PIN"'DFMU
2390 GOTO 2080'BEHH
2400 PRINT:PRINT"HOLE";H;"PLAYER#";I;
     "SCORE";SR(I);:TS(I)=TS(I)+SR(I)
     'EFCM
2410 T=SR(I)-PA(H)+4:IF T>7 THEN
     PRINT"REAL BAD":GOTO 2430'IUOK
2420 PRINT PM$(T)'BGEB
2430 PRINT:PRINT"[RVS]PRESS ANY KEY
     TO CONTINUE[RVOFF]"'CBMK
2440 GET A$:IF A$="" THEN 2440'EJHG
2450 NEXT'BAED
2460 PRINT"[CLEAR]"'BATF
2470 PRINT:PRINT"HOLE #";H:PRINT'DEYJ
2480 FOR J=1 TO NP:PRINT NA$(J);
     :FOR K=LEN(NA$(J))TO 15
     :PRINT " ";:NEXT'KCOS
2490 T=SR(J)-PA(H)+4:IF T>7 THEN
     PRINT"REAL BAD":GOTO 2510'IUOS
2500 PRINT PM$(T)'BGEA
2510 NEXT:PRINT'CBJB
2520 IF H=1 THEN PRINT:PRINT"AFTER 1
     HOLE":PRINT:GOTO 2540'HJMK
2530 PRINT:PRINT"AFTER ";H;"HOLES"
     :PRINT'DFUI
2540 FOR J=1 TO NP:PRINT NA$(J);'EMAI
2550 FOR K=LEN(NA$(J)) TO 15
     :PRINT " ";:NEXT:PRINT"IS ";'HQJM
2560 X=TS(J)-TP(H)'CLBJ
2570 IF X=0 THEN PRINT"EVEN"
     :GOTO 2600'FHSL
2580 IF X>0 THEN PRINT"+";X
     :GOTO 2600'FJCM
2590 PRINT X'BBPI
2600 NEXT'BAEA
2610 PRINT:PRINT"[RVS]PRESS ANY KEY
     TO CONTINUE[RVOFF]"'CBMK
2620 GET A$:IF A$="" THEN 2620'EJHG
2630 NEXT'BAED
2640 PRINT:FOR J=1 TO NP
     :PRINT NA$(J);" HAD A ";TS(J)
     :NEXT'GUBN
2650 PRINT:PRINT:PRINT"WOULD YOU LIKE
     TO PLAY AGAIN (Y/N)?"'DCDQ
2660 GET A$:IF A$="" THEN 2660'EJLK
2670 IF A$="Y" THEN RUN'ECTK
3000 PRINT A$;:NA$(I)=MID$(NA$(I),1,
     LEN(NA$(I))-1):RETURN'GGDF
```

END

Programming/Logjam

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1550 DATA 160,196,105,40,141,160,196,
     176'BFHJ
1560 DATA 3,76,191,196,238,161,196,
     238'BDEK
1570 DATA 165,199,173,165,199,201,25,
     208'BFYL
1580 DATA 209,169,0,141,165,199,169,
     3'BCBL
1590 DATA 141,230,196,141,235,196,169,
     4'BEMN
1600 DATA 141,231,196,169,216,141,236,
     196'BGPF
1610 DATA 162,0,189,19,199,141,3,
     4'BYSF
1620 DATA 169,1,141,3,216,232,24,
     173'BBEG
1630 DATA 230,196,105,40,141,230,196,
     141'BFUI
1640 DATA 235,196,176,3,76,5,197,
     238'BBLI
1650 DATA 231,196,238,236,196,238,165,
     199'BGKK
1660 DATA 173,165,199,201,25,208,211,
     162'BFGL
1670 DATA 0,189,44,199,157,97,5,
     189'BATL
1680 DATA 50,199,157,81,6,189,56,
     199'BBUM
1690 DATA 157,113,4,189,62,199,157,
     65'BCJN
```

```
1700 DATA 7,189,87,199,157,193,4,169'BBAF
1710 DATA 1,157,97,217,157,81,218,157'BCEG
1720 DATA 113,216,157,65,219,232,224,6'BDMH
1730 DATA 208,207,162,0,169,176,157,178'BEUJ
1740 DATA 5,169,1,157,178,217,232,224'BCTJ
1750 DATA 4,208,241,169,176,141,163,6'BCQK
1760 DATA 141,147,7,141,148,7,169,177'BCAL
1770 DATA 141,164,6,169,1,141,163,218'BCKM
1780 DATA 141,164,218,141,147,219,141,148'BGGO
1790 DATA 219,141,124,199,169,255,141,126'BGQP
1800 DATA 199,169,40,141,84,195,169,227'BEHH
1810 DATA 141,255,7,162,0,169,229,157'BCTH
1820 DATA 248,7,232,224,5,208,248,169'BCYI
1830 DATA 224,141,253,7,141,254,7,96'BBPJ
1840 DATA 173,14,220,41,254,141,14,220'BDRK
1850 DATA 165,1,41,251,133,1,162,0'BYSL
1860 DATA 189,0,208,157,0,48,232,224'BBNM
1870 DATA 0,208,245,238,170,197,238,173'BEQO
1880 DATA 197,173,173,197,201,55,208,230'BFPP
1890 DATA 169,48,141,173,197,169,208,141'BFAQ
1900 DATA 170,197,165,1,9,4,133,1'BXQG
1910 DATA 173,14,220,9,1,141,14,220'BARI
1920 DATA 96,198,198,80,230,105,66,130'BDCJ
1930 DATA 108,155,158,178,30,255,138,174'BFUL
1940 DATA 200,0,27,0,0,0,255,216'BWQK
1950 DATA 0,29,0,0,0,255,0,0'BSVK
1960 DATA 0,0,14,0,1,0,9,0'BQRL
1970 DATA 8,8,8,8,8,11,11,7'BRBM
1980 DATA 0,0,0,1,0,9,9,0'BPXN
1990 DATA 0,0,8,0,12,148,128,128'BWFP
2000 DATA 0,0,128,12,12,0,0,0'BTIX
2010 DATA 143,0,0,0,0,128,0,0'BTKY
2020 DATA 136,0,0,136,32,0,170,128'BYTB
2030 DATA 0,42,2,8,128,2,8,128'BULB
2040 DATA 0,170,128,0,42,0,0,42'BVRC
2050 DATA 0,0,42,0,0,0,2,8'BQSC
2060 DATA 0,2,8,40,0,170,128,0'BUVE
2070 DATA 42,0,0,42,2,170,160,10'BWOF
2080 DATA 170,168,10,85,104,9,85,88'BACH
2090 DATA 9,85,88,9,85,88,9,85'BULH
2100 DATA 88,9,85,88,9,85,88,9'BUOY
2110 DATA 89,88,9,105,88,9,106,88'BXXB
2120 DATA 9,106,88,10,102,104,10,190'BBWC
2130 DATA 168,2,190,160,0,56,0,0'BWEC
2140 DATA 48,0,21,0,0,85,64,1'BTED
2150 DATA 85,80,1,85,80,1,85,80'BVBE
2160 DATA 1,85,80,1,85,80,1,85'BUVF
2170 DATA 80,1,85,80,1,85,80,1'BUQG
2180 DATA 85,80,1,85,80,1,85,80'BVBH
2190 DATA 1,85,80,1,85,80,1,85'BUVI
2200 DATA 80,1,106,80,1,170,144,2'BXBA
2210 DATA 170,160,2,170,160,2,170,160'BCRC
2220 DATA 35,36,37,35,36,37,35,36'BXDC
2230 DATA 37,35,36,37,35,36,37,35'BXED
2240 DATA 36,37,35,36,37,35,36,37'BXAF
2250 DATA 35,36,37,35,36,37,35,36'BXDF
2260 DATA 37,35,36,37,35,36,37,35'BXEG
2270 DATA 36,37,35,36,37,35,36,37'BXAI
2280 DATA 35,36,37,35,36,37,35,36'BXDI
2290 DATA 37,35,36,37,35,36,37,35'BXEJ
2300 DATA 36,37,35,36,37,35,36,37'BXAC
2310 DATA 35,36,37,160,140,143,135,138'BDJD
2320 DATA 129,141,160,160,130,153,160,130'BGKF
2330 DATA 143,130,160,130,140,129,131,139'BGMG
2340 DATA 141,133,146,160,146,133,147,131'BGUH
2350 DATA 149,133,140,133,150,133,140,160'BGMI
2360 DATA 160,146,129,134,148,160,141,137'BGEJ
2370 DATA 147,147,133,147,135,129,141,133'BGGK
2380 DATA 160,143,150,133,146,144,129,149'BGDL
2390 DATA 147,133,35,36,37,35,36,38'BAVL
2400 DATA 39,40,41,42,43,0,0,2'BUYC
2410 DATA 8,0,0,32,136,32,136,0'BVYD
2420 DATA 0,2,8,0,0,2,8,0'BPYD
2430 DATA 0,32,136,0,0,0,8,16'BTVF
2440 DATA 86,90,106,170,1,1,255,0'BXJG
2450 DATA 7,7,8,9,10,11,12,14'BTHH
2460 DATA 15,16,18,21,22,0,12,233'BXWI
2470 DATA 97,104,143,48,143,24,210,195'BDOK
2480 DATA 209,31,96,0,0,0,0,0'BTVK
2490 DATA 0,0,0,0,0,0,0,0'BPEK
2500 DATA 8,10,7,9,8,10,7,9'BRAC
2510 DATA 8,10,7,9,8,10,7,9'BRAD
2520 DATA 11,11,12,13,11,11,12,13'BXEF
2530 DATA 11,11,12,13,11,11,12,13'BXEG
2540 DATA 11,10,11,10,11,10,8,7'BVKH
2550 DATA 6,7,8,10,9,8,7,5'BQDH
2560 DATA 10,9,8,7,6,5,4,3'BQUI
2570 DATA 8,7,6,5,4,3,2,1'BPPJ
2580 DATA 3,3,2,2,1,1,5,5'BPBK
2590 DATA 1,1,5,5,2,1,7,5'BPGL
```

END

Super Video

A new wave of video recording equipment has come into the consumer market, and it has profound implications in the areas of computer-generated video.

Every year new computer hardware and software is introduced that defines new limits to the capabilities of the medium. The same process occurs in video as technology creates, manufacturers produce and consumers acquire.

To better understand the significance of the new generation of video hardware we should first take a look at how current video equipment functions. I'll use VHS recorders as an example, but much of what I'll cover applies to Beta as well.

All consumer video recorders produced up to the end of 1987 adhered to the NTSC video standard for output. They produce an encoded video signal that mixed the luminance (brightness) portion of the signal with the chroma (color) portion. This mixing of the luminance and chroma in this fashion kept the broadcast video signal compatible with existing black and white television sets (b&w sets would just display the luminance portion of the signal), but the process of mixing lowered the resolution of the color image.

If you were to graph a standard VHS video signal (Illustration 1) you would see the relative position of the luminance and chroma segments of the video signal. Notice how the end of the chroma signal and the start of the luminance signal cross over. Also notice the width (1.0 MHz) of the active portion of the luminance signal.

The beginning of the luminance signal can be thought of as where the blackest blacks start. The end of the luminance signal would be the final whitest white. The range between these two is the contrast range that the video signal is capable of carrying.

Our eyes perceive detail by the changes in contrast in an image. The greater the range of gradations, the more detail we are able to perceive. In video the greater the range between the start and end points of the luminance signal, the greater the amount of detail we will be able to recognize. This translates into a higher

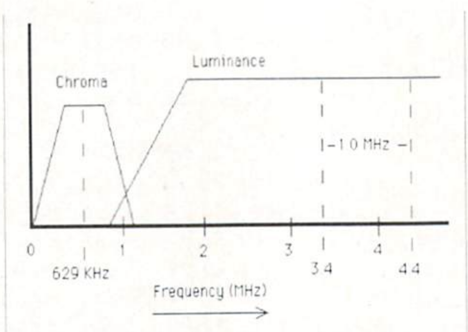


Illustration 1

level of resolution in technical specifications.

This is one part of the overall picture: the width of the luminance signal. But there are other elements to consider.

Take another look at Illustration 1. Notice again the amount of crossover between the chroma and luminance signals. This crossover can cause fuzzy colors and "dot crawl" where two highly saturated colors meet on the screen. If you can eliminate or at least reduce crossover, you can improve the clarity of the color image.

This gives us two areas in which to consider improvements. There is, however, a third area that can also be improved. To understand what changes may be beneficial we first need to take an in-depth look at the basics of the chroma signal.

The chroma portion of the video signal centers around 629 KHz. When you connect your television to your VCR you are connecting to a composite video signal. In it, the chroma and luminance have been mixed (encoded) together. This composited signal is the basis for the NTSC video standard. Once the composite video signal is inside your television it is separated again before it is displayed. If you record from one VCR to another this process occurs each time you go from one machine to another.

Each time the chroma and luminance are mixed and separated you lose a part of the signal. If you could avoid this process of mixing and separating you could gain a higher quality image on your television and also get better second- and third-generation copies of your tapes.

We now have three areas to improve: the width of the luminance signal, the amount of crossover between the chroma and luminance signals, and the degradation to the signal that occurs during encoding.

The first steps taken to improve the video signal were called HQ. This was a variable mix of additional circuits added to existing technology to make the image appear sharper. These circuits didn't really improve the recorded image, they just made it appear sharper. The three basic types of circuits were: white clip, luminance noise reduction and chroma noise reduction.

White clip helps improve the image quality in areas of sharp brightness transition. White clip uses a technique of overemphasising the transition between bright and dark area to compensate for VCR's natural inability to make that transition rapidly. By mixing the white clip signal with the normal video signal an improved version is created. The HQ white clip circuitry increases the white clip by 20% allowing for cleaner edges in these types of transitions (Illustration 2).

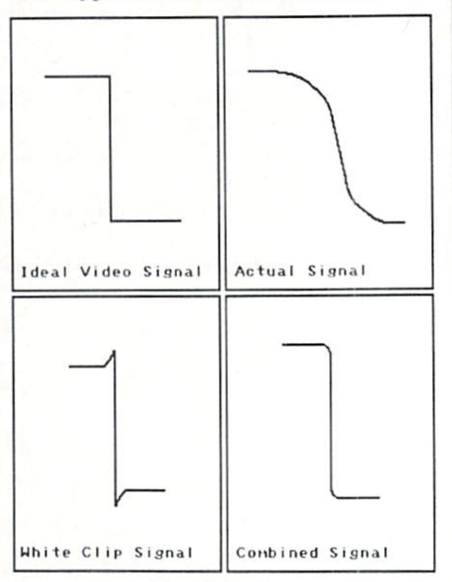


Illustration 2

The noise reduction circuits make use of recursive comb filtering. This is a type of circuit that combines information from two adjacent scanning lines in the image. This doubles the signal. Noise in the signal may result in a blip at some point on the scan line in one line, but it would most likely not appear at the same point in the next line. As a result the noise does not get boosted as much as the signal.

Beta operates in a slightly different way than VHS. The chroma portion of Beta centers around 688 KHz, and its luminance signal has about 20% greater width. This gives Beta a better overall image. The success of VHS over Beta has little to do with image superiority.

SuperBeta is similar to VHS HQ. The

main difference is that the starting point for recording the luminance signal is shifted to a higher frequency. This reduced the crossover between chroma and luminance.

Finally 8mm video was introduced. It shifted the chroma portion of the signal to center around 719 KHz. Since the physical tape size is so much smaller, some means of recording more information per inch had to be found. Improvements in videotape manufacturing provided the answer.

Videotape for 8mm is created using a very thin backing covered with a metal-powder medium. This new type of tape has more than double the signal density of standard VHS or Beta tape. Finally a breakthrough had been found.

All the elements for an improved VCR just came together at the same time: new tape technology, a decision to shift the frequencies used in recording video signals and improved filtering.

The developers of SVHS decided to use only a part of the new tape technology. At the time that SVHS was developed there was still some uncertainty as to whether metal-powder tape would have good long-term resistance to flaking. However some of the techniques that were developed to produce metal-powder tape could be applied to standard tape (notably finer particles) and result in a tape that could increase signal density by 50%.

Now that a tape that could take more signal was available a decision on how to make more signal available had to be made. To gain more detail in the video signal, the luminance signal had to be widened. At the same time elimination of crossover was a prime consideration. By shifting the starting point of the luminance signal higher, and increasing the deviation to 1.6 MHz both of these goals were met. An additional gain in resolution comes from shifting the starting point of the luminance signal higher due to the relationship between luminance frequency and carrier frequency (see Illustration 3).

Along with standard VHS HQ, improved white clip and noise filters, a special set of Faroudja Labs detail enhancing circuits are used to increase image detail (even from standard composite video sources) without boosting noise or crossover.

Finally a major new feature was made available in all SVHS decks. A new set of connectors were added. These connectors (called the S terminal or Y/C connectors) provide direct access to the chroma and luminance signals in an unencoded state. Connected to another SVHS deck, the S terminal lets you copy a tape while bypassing the encoding/decoding process that degrades the video signal. Connected to an S-compatible monitor you get a display that is sharper, with colors that are cleaner than any standard video monitor short of RGB.

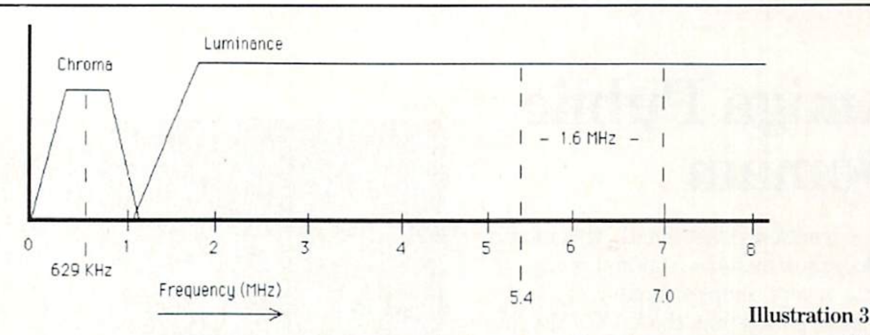


Illustration 3

The gains are phenomenal. Horizontal resolution jumps from 240 lines with VHS to 400 lines with SVHS. Third generation dubs look good, without the tremendous loss of detail and color smearing that accompanies standard VHS copies. Even tapes displayed on non-S terminal monitors look better due to the increased resolution. And should you doubt the quality of SVHS, a major television station in California has adopted SVHS for all of their field remote crews. Editing will be done on SVHS decks and then dubbed to two-inch tape for broadcast.

Not to be outdone, Sony has introduced ED-Beta, an extended resolution format for Beta. ED-Beta also shifts the starting point and width of the luminance signal, and makes use of a metal-powder videotape à la 8mm. S terminals and ¾ inch dub connectors will provide unencoded input and output. As with SVHS, standard tapes will be playable on the deck, but the new tapes will not play on older decks. Horizontal resolution is rated at a remarkable 500 lines.

In late-breaking news a new extended resolution format for 8mm video has been announced, although no hardware is currently in production. The new format will offer separate chroma and luminance signals, 450 lines of horizontal resolution and a wider shifted luminance signal.

What do you gain from all of this? Well, unless you choose to invest in new video hardware, nothing. But should you make the jump you gain a lot. The new formats are far better suited to handle computer-generated video. The saturated colors and fine details that graphics and animation programs generate often get lost once they are encoded from RGB into composite video. Keeping the signal in separated chroma and luminance components will help keep the quality of the recorded image at the same level as the image you saw on your monitor.

The improved multi-generational capabilities of the extended resolution formats will allow you to do extensive editing and layering in your video productions. As Y/C connector genlocks become available for the Amiga you will be able to keep the video signal unencoded throughout the editing process.

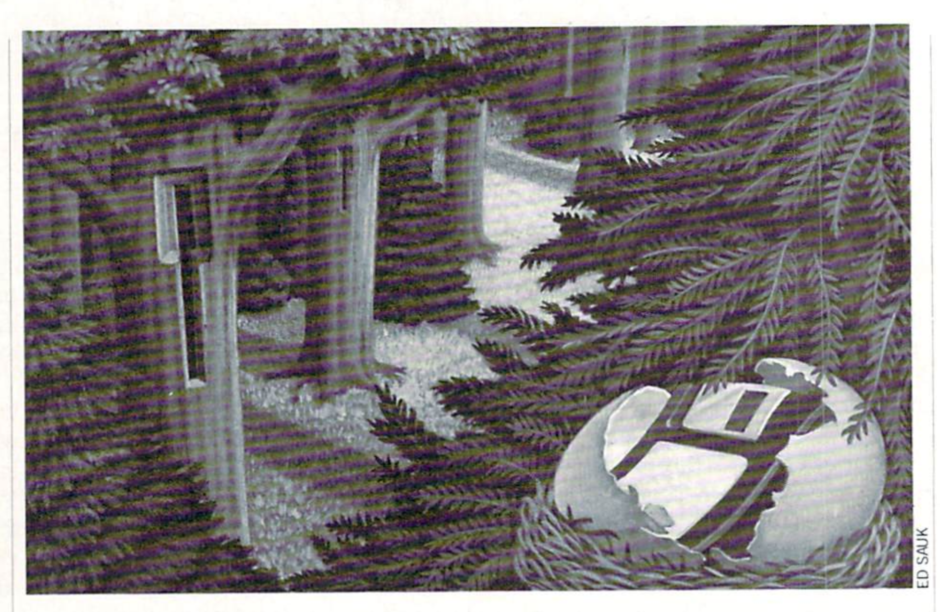
If you are in the market for video hardware for your Amiga you should keep in mind the eventual need for S terminal or Y/C connector capability. As more and more extended resolution video hardware hits the market, the prices will fall. Sooner or later you are going to own video equipment with this capability. C

by Graham Kinsey

Amiga Public Domain

As mentioned last month, this month's column includes a special review of Moria, a very complex fantasy role-playing game ported from the VAX/VMS environment. I have also reviewed Fish disks 139-146, which include (among other things) Turbobackup, a very nice disk copy program.

For each program, the author is given, and if that PD program is available on the Fish series of public domain disks, the number of each series is given before the description. Also if I get a PD program directly from PeopleLink's AmigaZone, I list the AmigaZone download file number (if no file number is given it doesn't mean that it isn't on PeopleLink, but I obtained it somewhere else), so those of you who have access to PeopleLink can quickly obtain this file. When a public domain program has been classified as shareware, this is also mentioned with the suggested amount.



ED SAUK

Procalc: by Gotz Muller
(Fish 139; Shareware: $25)

Another calculator program that emulates the Hewlett-Packard HP11C calculator. There are a few differences between this emulation and the real thing, including the manner in which numbers are rounded off and the non-implementation of the Gamma function. Registers are stored in a separate file when you turn Procalc off, so you can quickly resume computations where you left off. English and German versions of the calculator are provided.

Remlib: by Heiko Rath (Fish 139)

This program allows you to remove libraries from the Amiga environment. This is similar to the FlushLibs option from the Workbench menu (which, of course, is only available when LoadWB is called with the debug option), except that Remlib lets you choose which library to remove. To help you decide which libraries to get rid of, Remlib by default will give you a current list of all the libraries (including any overlays like the ones present when running *WordPerfect*) that are presently loaded into system memory. Among the types of information displayed with each open library are the version and revision numbers of each library and the OpenCnt value of each library.

TurboBackup: by Steffen Stempel and Martin Kopp (Fish 139)

A full-featured disk copier designed to copy standard AmigaDOS disks as fast as possible. The authors claim that TurboBackup's copy with verify time of 103.5 seconds for one destination disk is as fast as possible with the current Amiga hardware. TurboBackup is unique in that it forces verify of each track on the destination disk(s) for each and every copy, since the authors feel it is ridiculous not to make sure that there aren't errors on a destination disk!

TurboBackup supports up to four floppy drives at once. If an error is detected on a particular track, TurboBackup will retry up to four times, and it will not only let you know that a retry was necessary, but also whether or not it was successful. TurboBackup has sounds that will let you know when a copy is almost finished and if an unrecoverable error on one of the disks has been detected.

TurboBackup supports multitasking, although it takes control over all floppy drives hooked up to your Amiga, even if they are not currently being used to copy to/from a disk. One of the most important features of TurboBackup is that it can easily handle two different disks in floppy drives that are identical including having the same time/date stamps. This problem of identical disks is not handled by other copiers, and some copy programs can even lock up when identical disks are in the drives.

WheelChairSim: author unknown
(Fish 139; Shareware: $20)

Although this program may seem to be some sort of game when you first load it up, its purpose is much more serious. This is a wheelchair simulation designed to teach handicapped children how to control a motorized wheelchair while practicing in a safe environment. A standard joystick is used for input during the simulation. There are two separate version of the simulation—a two-dimensional view and a solid three-dimensional view. In addition to the supplied course, a Maker program is provided to create your own courses. In addition to adding walls and doors, the Maker program allows you to add tables, chairs, large cones, bulletin boards (with messages) and happy faces.

FracGen: by Doug Houck (Fish 142)

FracGen is a fractal generator that does not create the same types of graphics as the average Mandelbrot generator. Instead of creating entire screens of mathematical graphics, FracGen draws recursive lines to create interesting filled stick figure graphics. FracGen works with a line segment seed that you can create and alter as much as you like. Included are commands to flip, move and edit line segments. All graphics are created in a hi-res color screen. (WARNING: when running FracGen my error handler (GOMF 2.0) reported that the program was attempting to trash the low area of system memory. Therefore, use this program *at your own risk.)*

DMouse: by Matt Dillon (Fish 145)

Those who are interested in multi-utility utility programs like Mach now have two such programs to choose from. Some of the standard features include mouse acceleration, screen blanking, NewCLI hotkey, WindowToFront and SunMouse (automatic activation of a window when the mouse pointer passes over it).

In addition to supporting the WindowToFront feature, DMouse also allows you to instantly send a window to the back. One of the features not found in Mach but available in DMouse is the MouseOff feature, which blanks the mouse pointer after a set interval. If you find yourself constantly moving the mouse just to uncover the part of the screen that is blocked by the mouse pointer you'll welcome this feature. DMouse does not contain a clock program, since Matt feels that most people already are happy with their current clock programs.

DMouse does not have to be run from the CLI, therefore an icon is provided with the program for the Workbench fans out there. However if you want to modify any of the features of the program you will have to use the CLI to talk to DMouse once it is running.

DNet: by Matt Dillon (Fish 145)

DNet is a link protocol that allows Amigas and UNIX (BSD 4.3) machines to communicate with one another. Files can be sent via DNet to and from an Amiga computer and/or a UNIX system. DNet also allows for simple chatting between users on these systems. Servers are currently written for chatting, file transfer and remote shells, with more planned in the future.

Tab: by Jeff deRienzo (Fish 145)

If you are a guitar or banjo player and can read tablature music for these instruments then you may have a need for Tab. Tab lets you write tablature music for either instrument. The Amiga will play the music that you write under this program, and many instruments are provided for this purpose.

TinyProlog: by Bill and Bev Thompson (Fish 146)

For those who would like to experiment with the language Prolog, TinyProlog is a simple but functional Prolog interpreter. Full source code for the interpreter is provided (in C) for those who might like to examine the inner workings of an artificial intelligence-oriented language like Prolog.

Blanker2: by Joe Hitchens (Fish 146)

Blanker2 is a screen-blanking program for those who don't need other features like a mouse accelerator, clock program or NewCLI hotkey. Blanker2 is tiny (only 6620 bytes in size). You can specify the blanking period from CLI, and it has an icon to be run from Workbench. Once installed, Blanker2 does not provide for a means to remove itself from your environment.

MemoPad: by Michael Griebling (Fish 146; Shareware: $20)

This is a simple memo-creation program that lets you create notes and attach a date to them. There are options to search for any memo that you have created, and to create one memo copy to multiple dates. A separate program is provided to check whether a memo exists for today's date.

Due to time and space restraints I couldn't fit in the new programs from PeopleLink or local BBS's this month. I already have about two dozen good PD programs waiting in the wings at home plus at least another dozen sitting in PeopleLink's AmigaZone waiting to be downloaded.

As always, I can be reached on the Amiga Zone on PeopleLink (ID: G KINSEY), or on the IDCMP BBS (617) 769-3172 (300/1200/2400 baud, running 24 hours a day), addressed to SYSOP. If you have written a public domain/shareware/freely distributable program, or have obtained one that you think is worth mentioning to all Amiga owners, please attempt to contact me via the above or through *Commodore Magazine*. See you next month.

***Fish disks:** For a catalog, send a SASE and four loose stamps or $1 to: Fred Fish, 1346 W. 10th Place, Tempe, AZ 85281.*

*To sign up to **PeopleLink** and their AmigaZone, call them at: (800) 524-0100 (voice) or (800) 826-8855 (via modem).*

MORIA

(AmigaZone file # 11815)

If you are a fantasy role-playing (FRP) addict like thousands of other Amiga users, you can now rejoice over Moria, the third well-known FRP game originating in the world of mainframes to be ported to the Amiga! Just like Hack in 1986 and Larn in 1987, Moria has now appeared in the Amiga PD arena. The game was originally written by Robert Alan Koeneke for the VAX/VMS environment and was ported over to the Amiga by Bryan T. Henderson. If you thought that Larn and Hack were complicated and intricate FRP games, wait until you see Moria.

Moria is so complex that it requires one megabyte of memory to run (I thought you 512K owners should know this up front instead of cruelly waiting until the end).

After the game loads, you have the option to load in a saved character or start a new one. If you choose to start a new character, you are prompted to pick from any one of eight different races, including Human, Half-Elf, Gnome and Half-Troll. Then after inputing which sex your character will be (which has very little bearing on the game), your character's physical and social attributes are determined.



Figure 1. Screen dump of character.

The first thing veteran FRP fan will notice are the six attributes. These are the same six attributes found in AD&D adventures (and in Larn as well). Unlike Larn, Moria does support percentile ratings like the one used for characters with strengths of 18 (as per AD&D). However, Moria supports percentile ratings for all six attributes, not just a rating for Strength. Furthermore, there are no class restrictions on which characters can have a percentile rating attached to attribute scores of 18. You will also notice that values for age, height and weight are given.

You may be surprised to see a rating called Social Class, below which appears a paragraph entitled Character Background. The Social Class rating determines where you start in life in terms of money (e.g., how rich and successful your parents are and how you "relate" to your parents), and the Character Background briefly explains your Social Class rating.

Now you are presented with the choice of character class, with up to six (depending upon race) classes to choose from: Warrior, Mage, Priest, Rouge, Ranger or

Paladin. You can also choose to start the character creation process over again. If you didn't like the "roll of the dice," don't bother to proceed any further. Once you choose your class, your final stats are presented. Your character's abilities (which were modified according to the class you chose) are presented in final form (see Figure 1). Likewise, your character's final bonuses To Hit, To Damage and To AC (Armor Class) are also shown. Your initial amount of money in terms of gold pieces (which is based on your Social Class rating) is also shown.

Now two of the most important character values—Hit Points and Mana—are displayed. Hit Points should, of course, be self-explanatory to the vast majority of you, and Mana are spell points that are given to spell casters. Mana Points are needed to cast any type of spell. (Many computer FRP games, including the *Ultima* series, use spell points for spell casting, so this should also be familiar to most of you.) After you type in your character's name, any character who can cast Mage spells now gets to pick which spell he will start off with (as you might expect, those characters who cast Priest spells don't get to pick which spells they will learn).

Finally, you can start adventuring. Or so you think. While your character's parents did bestow a nice sum of gold, they didn't bother to provide some basic equipment. If you look at your beginning inventory, all you have to start out with is a measly dagger, some food, a few torches and either a beginner's spell book or some leather armor if your character is a Warrior. Luckily you don't start out in the dungeon (unlike in Hack).

Instead you start out in a town with six shops. Does this sound reasonable? Well, going into one of the shops and buying something isn't an instant transaction. When you tell the shopkeeper you want to buy something, you'll find that you don't have to pay list price of anything. No, I'm not talking about mail order, rather I'm referring to the ancient art of haggling. How much you pay for something depends on whether you can convince the shopkeeper to lower the price. Don't worry, you will become very adept in the art of haggling, because there are many items you can buy, even with the small amount of gold you begin with.

For example, when you enter the armory, you cannot buy whole suits of armor; you have to buy each piece one at a time. You can buy gloves or gauntlets for your hands, boots for your feet, caps or helmets for your head, and main pieces of armor for your torso and legs. Of course, shields are separate as are cloaks (which are bought in the General Store) which are worn on top of everything else. Naturally there are several or even dozens of types of armor for each part of the body.

Each particular piece of armor has a base protection value which increases your Armor Class by that set amount. Unlike AD&D in which Armor Class values for characters start at ten and drop in value (to a maximum protection of at least -10), Armor Class ratings in Moria start at zero and increase in value. The documentation for Moria states that an Armor Class rating of 40 is about maximum, but I found out that this is not the case, and even with non-magical pieces of armor your character can still achieve an AC of at least 43, and of course magic can increase armor protection values by up to nine points for *each* piece of armor.

The Weaponsmith's shop is just as intricate. Not only are there dozens of weapons, but for each weapon there are several types. Not only are there daggers, but also Stiletto Daggers or Main Gauche Daggers. There are normal Battle Axes and European Battle Axes. And in the case of magical weapons, there are two basic magic values for all weapons instead of just one. Unlike in AD&D where a +5 Broadsword means that that sword is +5 to hit and to damage, in Moria there are separate values for To Hit bonuses and To Damage bonuses. The Moria equivalent of an AD&D +5 Broadsword would be listed as a Broadsword (+5, +5). Therefore unlike in AD&D, in Moria weapons can have different magical factors To Hit and To Damage. This is very important, since if you pick up a Glaive (+8, +0) you better not drop your Lucern Hammer (+7, +7) in favor of it. If you do, you might find during the heat of combat that although you are having great success in hitting that Giant Troll, your Glaive is barely cutting his hide! Keep this in mind, otherwise you may find Kobold laughing at your character who is threatening him with a Sling without a stone inside it.

The General Store is where you will be able to purchase light sources (torches and lanterns), food (preferably food rations, although if you are very poor your character can subsist on beef jerky), liquid refreshments, shovels and picks (more on those later), iron spikes and other basic tools.

The other three shops aren't quite as vital to all beginning characters, but you will become very familiar with them soon enough. The Temple is where Priests can buy blunt weapons like Maces and War Hammers that they must use, and all characters can purchase all types of healing potions. The Alchemy shop is where you can purchase all the other types of potions that the Temple doesn't carry, plus all types of Scrolls. Finally for those who have money to waste, the Magic Shop has various types of Wands, Staves, Rings and Amulets that beginning characters can only dream of purchasing.

In addition to the six shopkeepers, you have other people to contend with while in the town. Unlike in Larn, whose town resembled a ghost town, the town in Moria is bustling with all sorts of people (and most of them aren't exactly a joy to talk to). There are urchins who love to hassle or amuse you then steal you blind. There are also older thieves (substitute your favorite urban gang member type) who may steal from you and/or cut you to shreds. There are also seasoned warriors who although half-drunk can still slice and dice the average beginning character into bite-sized portions faster than a food processor. If you are reckless, or just spend too much time in town, you may die before you ever reach the dungeon.

Once you actually make it to the dungeon entrance and go down the steps, you will see a room usually filled with a few monsters and objects. Actually, *if you remembered to light your torch* you will see a room, otherwise you may see absolutely nothing unless your character has infravision, in which case you may at least see a monster or two in the dark. Of course, you might be lucky enough to enter a room which has torches on the walls, but don't get used to this occurrence, since that is the exception, not the rule.

In the dungeons of Moria there are hundreds of different monsters with all types of attack and defense forms. There are, of course, dragons which breath fire, giants which smash you with their fists, and orcs who'd just love to impale you with a spear. There are also many unique features of some of the monsters in the dungeons of Moria. For example, there are monsters like worms, bats, rats and yes, even vicious rabbits, that can multiply faster than a computer virus. While you are in a life-or-death struggle with a Hobgoblin, a few rats that wander into the room may quickly multiply to twenty and attack you from all sides. There are many monsters that spew forth acid. While this may not seem too dangerous, you'll soon find out that acid can corrode your armor, eventually turning even magical armor into pieces of junk. Equally distressing are

monsters that can literally suck the magic out of items. You won't be very happy when after bashing a Disenchanter Bat you notice that your Morningstar (+6,+6) has become a Morningstar (+0,+2). Certain monsters can also install a powerful aura of fear in a character. Those who don't invest in ranged weapons will pay for this when their character is too afraid to melee with a monster. While there are many monsters that are invisible, others have the ability to teleport. It's bad enough to chase a thief who just stole your arrows when he's invisible, but it's even tougher when the thief teleports instantly to another room.

Of course, there are other aspects of adventuring besides slaying monsters. You will notice right away that the dungeon levels in Moria are much bigger than those in either Hack or Larn. The levels are so large that the game must scroll the display as you move from room to room. As in Hack, many of the doors in Moria are hidden from view and must be searched for. However, (unlike Hack) doors aren't always open. When they aren't open, you have to try to bash them to pieces before you can pass.

Another unique feature of Moria is digging for treasure. Although you will constantly find valuables lying in many rooms, sometimes you will see a valuable gem or chunk of gold embedded in the wall. When this occurs, if you want the valuables, you will have to dig for them. If you purchased a shovel or pick in the General Store, now is the time to use it. There are four different types of stone that make up the walls and filled in areas that are a part of Moria's dungeons. Permanent rock (which can't be tunneled through) and granite rock never contain valuable gems or ores, but magma intrusions and quartz veins often contain such valuables. In addition to gems hanging out of walls, valuables can also be found by digging deep into the rock formations inside the dungeon walls. Rubble and loose stones may also hide valuable items but could cause your character to trip and fall if he isn't careful.

Speaking of being careful, Moria has its own variety of traps, that run the gamut from explosive runes to paralyzing gases to poison darts. Even if you do find them, that doesn't mean you will be able to disarm them.

There is one more thing that Moria possesses: depth. There are 50 dungeon levels in Moria, and your character has to walk through every one of them (at least once) in order to reach the ultimate goal: to meet and destroy the Balrog, who is the most powerful opponent in Moria.

As for what Moria doesn't have, the initial release (version 1.10) does not have color graphics like the current versions of Hack and Larn. I feel that the mechanics of the game are so superior that most FRP fans won't miss the graphics a bit (if you want great graphics, play *Faery Tale Adventure*). Although I can't say that Moria never locked up on me, it happened so rarely that it was a very minor nuisance.

Check out Moria if you are looking for a challenging and very complex FRP game for the Amiga. Moria should be available on most Amiga BBS's, and of course it's available for download on PeopleLink's AmigaZone. Finally, here's an important tip: Although Moria does not allow you to make a backup of a saved game by copying the file, there's no reason why you can't make a copy of the disk the file resides on! Just make sure to use a disk copy program that retains all time/date stamps. Any decent commercial disk copier should do, as well as the PD disk copier TurboBackup reviewed this month. Have fun with Moria, and beware of the Banshee! ■

Adventure Road/Quest for Sequels, Part 2

Continued from page 54

ing sections as your character moves through the streets and buildings. The first game put the entire town on screen at once and offered far less in the way of detail and interaction with merchants. Music and sound effects were dramatically upgraded for the sequel. Auto-mapping is also found in this game, whose mazes are easier to map than those of *Bard's Tale* and *Ultima*.

It takes place in the land of Landor, where you'll explore a pair of continents and fulfill assorted mini-quests while seeking to complete your main mission. Much of the action centers on a place called the Hall of Visions. If this reminds anyone of the Galactic Museum in *Legacy of the Ancients*, there is a very good reason: that game was also written by the Dougherty brothers, who designed *Questron II* but turned it over to a Las Vegas outfit called Westwood for the actual programming.

Sierra's Next Sequels

Amiga gamers can soon look forward to *King's Quest IV: The Perils of Rosella*, which will be the first games in the series in which your character will be a woman. It will also mark the introduction of a new graphics system that provides 320 × 200 resolution—twice the detail of Sierra's previous animated adventures. I hear they're also doing *Space Quest III* and a sequel to *Leisure Suit Larry*.

Quest for Clues

Bard's Tale III: Hopefully this "bug," which greatly accelerates character development, will be left in the 64 conversion. After finishing the starter dungeon, visit the Review Board for a 600,000-point bonus (enough to raise the party one or two levels). Leave, drop a monster from the party, cast a spell to summon another one and reenter the Review Board—everyone gets another 600,000 points. Repeat as needed. Priest giving you trouble at the entrance? Say dibpt. If you're having trouble with Lanatir's Blood, try DBMB. At Valarian's Tomb: Use Utmpuib't Ifbsu, then the Xbufs. In *Questron II*, you can avoid deadly ocean encounters on the way to the Realm of Sorcerers by taking the Psc from Castle Redstone to Npsmf in Rivercrest Tomb. (Count one letter back to decode clues, which were provided by QuestBusters' Randy Sluganski and Charles Don Hall.) ■

Continued from page 46

colors. And you can use a different palette for each page, although certain transitions do require the use of the same palette to work effectively. There is also a function to create grids as well as tiled or wallpapered backgrounds comprised of user-defined text generated by *PVP*. Most important, you can load and display a standard 16-color IFF picture (such as a digitized image or a picture created by a paint program). Any text written on top of this picture will not destroy the underlying picture, making editing a breeze. Once loaded, *PVP* will attempt to convert it to the 672 × 440 format and will save it using a special space-saving format. You must have at least 1.5 MB of memory to use an IFF picture.

Linking the Pages

Once you have created your pages, it's time to link them in a coherent, artistic manner. Pages are always displayed sequentially in the order you created them. If you don't like the order, it's not a simple task to rearrange them. Although it can be done, the likelihood of inadvertently deleting one or more pages is quite possible if you are not careful. To minimize this possibility, I suggest leaving an empty page in each group of ten.

PVP excels in the transition from one page to another, providing over 90 preset transitions. The first 32 treat the entire page as a unit while the remainder operate on a line-by-line basis. Take, for example, a page with six lines. Page transitions will make all six lines appear at once, while line transitions will allow each line to appear individually, either in ascending or descending order. A custom transition feature also allows you to specify the order of the lines and the transition effect for each line.

The transition function also permits you to select the speed and length of time the page remains visible. You can also set a flag which tells the display function to skip the screen if you decide you don't want to include it in your presentation (or if it's blank). While there is not enough space to describe every transition, suffice it to say that *PVP* provides everything you need to obtain a truly professional result equivalent to anything you may see on television. There is even a special feature which lets you link screens together to achieve both a vertical rolling effect for displaying production credits and a crawling effect to display horizontally moving messages at the top or bottom of the screen.

Once your pages are all linked, you'll want to save them to disk. Your job is saved in a special format permitting a large presentation to occupy a very small space. For example, 100 text pages use about 120,000 bytes—less than two IFF pictures! Any IFF pictures you have used must be saved separately and must be loaded in the same sequential order they are to appear in your presentation.

Displaying

Now that your job is completed, it's time to show it. As I mentioned previously, your job is stored in ten groups of ten pages—even if you created less than a hundred. Unlike other presentation programs which have a separate "player" program to automatically display your work, the display function is an integral part of *PVP*. Once your job is loaded, press the ESCape key to access the display mode and your first page is displayed. You can press the cursor up key to move to the next page or the cursor down key to reverse. To display any individual page type the page number (and bank number if you have more than one bank) and RETURN.

Using the ten function keys, each of which represents one group of ten pages, you can display those groups automatically. In this mode the pages remain visible for the time you set with the transition function. For example, if you press F3, pages 20 through 29 will be displayed sequentially. There is also an auto-cycle mode which will automatically display selected page groups and entire banks and, when finished, start over again. Unfortunately the program isn't able to utilize a joyport device to permit page-by-page display from a location further away from the Amiga than the keyboard cable can stretch.

The documentation is quite thorough but assumes that you have a basic understanding of video text generation. It contains a short tutorial, a reference section and some advanced techniques. The program consists of two diskettes. *PVP* is not copy protected and is quite simple to store on a hard disk drive. If you want to play back your job at multiple locations (such as point of sale demos), you must obtain a multiple-site license from Shereff or purchase multiple programs. For professional video use, you must also route the video output through a professional genlock device to obtain a true NTSC signal suitable for broadcast use.

In sum, *PVP* produces text which is crisp and transitions which are both smooth and stunning. It is truly a professional video tool which brings quality character generation within the reach of those who previously couldn't afford a dedicated computerized character and graphics generation system. Moreover, its application is clearly not limited solely to video production, as it can be used quite effectively for business presentations and point of sale applications. *PVP* has raised the Amiga to a new level of utility and excellence and makes it a viable alternative even for those who *can* afford to spend upwards of ten times as much for a video computer. Although the program is priced for the professional market, avid amateur videophiles will undoubtedly find it a valuable addition to their software library. ■

PVP produces text which is crisp and transitions which are both smooth and stunning.

Software Reviews/The Last Ninja

Continued from page 32

your opponent is getting the best of you, quickly retreat to the previous screen. When you return, the enemy has returned to his original position, allowing you to strike the first blows again. Repeat this movement as often as necessary.

Another useful tactic is to strike the initial blow to the opponent's head, severely disabling his reaction time. Follow this with rapid blows to the mid-section. This method will often finish an opponent off using only three or four strikes and minimal damage to your ninja.

Players begin the game with three lives and are awarded an additional life at the start of each level. Bonus lives are also granted for each magic apple collected along the way. After losing all lives, players begin the game again at the start of the current region. The game's only drawback is the lack of a save game option. To win, players must complete the game in a single sitting, which can take hours.

The Last Ninja offers a diverse assortment of challenges, including arcade action, puzzle-solving and goal completion. Pleasantly frustrating and highly addicting, this game is in a class of its own. ■

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to do it:

Before resetting margins, cursor back to the last spot on line 31. Press RETURN. Now reset your margins for line 32. While you're at it, reset the P (paragraph marker) so that it's even with your left margin. That done, I went to the next paragraph and reset the right margin to 2.1. I continued doing this paragraph by paragraph until I had created 16 lines of skinny text. That brought me to line 48 which I wanted to be back to the full column width. How did I know that lines 32 through 47 should be narrow? I had already drawn my cartoon with *geoPaint,* and I simply compared its height with 10-point font height.

Before going on to Step 4, there was one more problem. Line 48 was in the middle of a paragraph. So I did just as I described above: I cursored to the last spot on line 47, pressed RETURN, then reset my line 48 margins to full width (moving the paragraph marker out to the left margin marker).

Step 4: Next I journeyed to the bottom of page one, three lines up, and set a page break. Why three lines up? Because I discovered (*laboriously* discovered) that when Overlaying, the last three lines (or so—it depends on the font) never quite make it to the *geoPaint* file. Ding! Page 1 is prepared. Break time.

Round 3: Preparing Page 2

Step 5: Now for page 2. I reset my margins for the entire page to 4.3 and 8.0. Then I counted down to line 32 and repeated the process just as I did for page one on lines 32 through 47—but this time moving my left margin instead of my right. I moved it to 6.0. Again, any margin changes within paragraphs required the special treatment as described above.

Step 6: I went to the bottom of page 2 and checked to see how things came out (I didn't want a page 3). I got lucky: my page 2 ended just where I wanted.

I lied. I didn't get lucky. I had a page 3. So I went back through the entire process and changed the fonts. You see, I had really started with a 12-point font. So I changed it. And repeated the entire process because all my lines were different now. And let me warn you: you will do the same if you want your page to be filled with text just right. It's worth the effort.

Round 4: Printing the Paint Overlay File

Step 7: Finally, with everything the way I wanted, I printed my file. Once back at the deskTop I discovered a new file named "OVERLAY." Good, this is what's supposed to happen, I thought. So I double clicked it and waited for *geoPaint* to load. Soon I was looking at a blank *geoPaint* screen. Hey, this isn't what's supposed to happen, I thought.

Let me be honest: I hadn't done Round 1 quite like I described. I hadn't formatted a new disk. I just used an existing *geoWrite* work disk that had only 40K or so left on it. I think that's what caused my blank disk. *GeoPaint* files can snarf down a whole *gob* of disk—the example document here took up approximately 50K. The manual says to have at least 5K available, but I think that's a typo. It should be 50K. Anyway, after lots of experimentation I've decided the best way to make the Paint Drivers work is to put them on a freshly-formatted disk.

Step 8: I drew my picture. Well, there I go, lying again. As I said earlier, I created my cartoon before writing the essay. This was a mistake because then I had to make the *geoWrite* file fit the picture instead of the other way around which would have simplified matters greatly.

I also made the mistake of making my cartoon just slightly bigger than a single *geoPaint* window. When I realized I had to move the cartoon, it caused me lots of grief. My advice to you is stick to one-window illustrations and do them ex post facto the Paint Overlay process. It's easier that way.

Rounds 4 through 43,988: Re-doing Things

That's all there is to it. It took me about eight hours of legitimate work (legitimate work does not include trips to the refrigerator or bathroom, staring at my reflection in the monitor, or going outside to check the mail) to finish the document you see printed here. Follow my suggestions and you'll have much better luck.

I haven't described the Paint Pages process here, but it is much simpler because you aren't overlaying text on text on graphics, etc. You are simply converting text files to *geoPaint* files. If any one lesson stands out in my mind after completing this, it's that you should do your Overlaying of *geoWrite* files first then do your *geoPainting* later as you would with any *geoPaint* file.

Next issue we'll take a look at *geoMerge, geoSpell* and some other *geoWrite* extras. In the meantime, don't forget to keep Pumping GEOS. ■

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Bruce Lee: You can get five extra lives by going to the purple screen. After you collect all the lanterns, climb up the first door on the left. You'll find yourself at the top of a gray screen. Fall to the ground and run to your right, collecting lanterns as you go. When you reach the end, you will see some gems that look like Chinese symbols. Collect them and you will get an extra fall. Run back to the previous board, then go back to the screen with the gems. Repeat this until you get five extra lives, then go back to the first board by running to the left. Collect the lanterns and resume playing the game.
Andrae Singh
Jamaica, NY

Castle Wolfenstein: Here is a pattern for escaping from any castle: Up Stairs, Down, Left, Left, Down, Right, Right. Up Stairs, Right, Up, Left, Left, Left, Up, Right, Right, Up, Left, Left, Left, Up, Right, Right, Right, Right, Down. Up Stairs, Down, Right, Up, Up, Up. Up Stairs, Right, Down, Left, Left, Up, Up, Right, Right, Right.
Jason Wiedman
Holbrook, NY

Conan the Librarian: When the librarian tries to "shhhhh" you, respond by asking her for a date. Remember the old saying—"third time's charm."
Mary Lee McCafferty
Butler, PA

Dan Dare: Hitting the RESTORE key during play will restart the game without having to reload it. Pressing SHIFT LOCK pauses the game, freezes the screen, and plays some music. To resume, just release the SHIFT LOCK key.
Dianne Banker
Runnemeade, NJ

Defender of the Crown: This works for the Amiga version of this game, and should work for the others as well. After you have picked the land you are betting in Jousting, wait until your character moves toward his spot. Then put the mouse arrow between the RED and YELLOW tents, and you have won the match. Don't move the arrow until the match is over.
Kenji Yuhaku
Monterey Park, CA

Demon Stalkers: Tired of invisible vortexes? On the level before you encounter them, launch a death spell as you exit down a chute or set of steps. The next level will have a white floor.
Jason Spears
Harrison, TN

Flight Simulator II: The Simulator takes 65 seconds to reset after the first crash. Entering the Editor for the first time takes 45 seconds. If you enter the editor immediately after loading the program and quickly exit, there is only a 90-second wait. Then it only takes a fraction of a second to reset after a crash or to switch between Flight and Editor modes.
Contributor Unknown

4th & Inches: Always take the Champs. They have a better running game and great receivers. They also convert better on fourth down. On offense, use the Post and Corner pass plays; they are not straight, so the receivers lose the coverage easier. Throw screens to Darling and Harris, who have enough speed to turn plays into big gains. On other short passes, throw to Smersh. He's fast for his size and on some occasions can turn big gains.

On defense, operate out of the Nickel. The All-Pros like to pass. When the ball is snapped, watch the offensive line—if they fire out, the play is a run; if they drop back, it's a pass or a draw. On a pass play, if you see a receiver run straight, make a cut, and then continue straight, it's usually safe to assume he's the intended receiver. As the pass comes in, move your hands into it.
Keith Rains
Duncanville, TX

Gateway to Apshai: If a goblin, ghoul, ogre, mamba snake, or any other enemy comes after you, try to get a thin wall between you and your enemy. You can then kill him with your sword or dagger.
Mark Keeling
Inverness County, Nova Scotia
Canada

GFL Championship Football: When you run the ball, you can wiggle your joystick left to right to break a tackle.
Benton Genus
Los Angeles, CA

Gremlins: In the house the peltzer remote control will control the blender, microwave, laundry chute and the drawer. Use the ladder from the garage to get into the trap door at the top of the department store stairs.
Justin Stephenson
Evansville, IN

Hard Hat Mack: You can change levels very easily by holding down a number key between 1 and 3 (1 for level one, 2 for level two, etc.) and pressing the fire button while the title screen is still displayed.
Omar Salinas
Address Unknown

Hitchhiker's Guide to the Galaxy: Those babel fish are pretty slippery characters, as you may have already found for yourself! The cleaning robots are no help, since their mission in life seems to be grabbing your fish away from you.

Well, we can't have that happen, can we? First hang your gown on the hook. Then wait for Ford to go to sleep and take the towel and the satchel. Put the towel over the drain, and the satchel in front of the robot panel.

Now comes the part that drives most people crazy—stopping the upper half of the room-cleaning robot. Just put the junk mail on top of the satchel! Now you can stand back and watch your Rube Goldberg Shenanigans go to work, with the babel fish landing right in your ear (squish)!
Eddie Staszko
Mayville, WI

Jeopardy: If you don't like it when your computer opponents answer questions before you can read them, put three players in and only use one for the game. If the answer is on the tip of your tongue but you need more time to bring it out, just hit your opponent's key and think of it as his or her time runs out.
Justin Stephenson
Evansville, IN

Karateka: When you get to Mariko, run to her, don't walk. If you do walk, she will think you are trying to kill her, and she will kill you in self-defense.
Keith Sharp
Address Unknown

Kung Fu: To kill the giant, continuously kick the air. He will walk off the screen then come back on. As he is walking, kick once and he'll back off. Keep repeating this and eventually he will die.
Contributor Unknown

Kung Fu Master: All you have to do to beat the guy on the third level is to keep on getting him with low kicks.
Derek Hansen
Wheaton, Illinois

The Last Ninja: When on level five, pick up the apple outside the palace. Enter the palace and fight. When you are down to one life, go back outside and there will be another apple. It works every time.
Tom Donovan
Address Unknown

Legacy of the Ancients: When you get a Topaz Coin, go to the Museum and go to the back of Ti. There is a native currency exhibit there. Use your Topaz Coin there and you will receive a small fortune.
Peter Liang
Ann Arbor, MI

Legacy of the Ancients: Normally you can only buy either 100 of the four least expensive spells and 20 of the Kill Flash spells. As you may well know, an extra magic spell in the Dungeons can mean the difference between life and death. To get an extra spell, especially the Kill Flash spell, go to the Magic Shop with just enough gold for one spell. If you do this and already have the maximum amount usually allotted, the computer will not flash the message, "You can't buy this many." This process can be slow, but patience, especially in this case, is a virtue.

Also while traveling through the Wilderness, talk to all Striders, Huggyns, Eaton Warriors, Farmers and Shadow Wisps. These weaker creatures usually don't carry much gold, and they may sell you weapons, armour, food, and maybe even museum spells, often at a discount price.

Another life-saving tip—while walking through the mountainous terrain, attempt to disengage from all Mammoth Screecher attacks. Because of their immense strength, they can easily kill weaker characters.
Matthew Webster
Keymar, MD

Legacy of the Ancients: In Blackjack, press the space bar when the dealer is laying down the cards. This will make the cards appear really fast, and the dealer won't have time to cheat. This works better with newer characters (those under about 1000 days old), but still it works with anyone. Towns in which the gambling is usually profitable work best. Be sure to leave the town and come back again about every 1500 gold you win or else the guards will come after you.
Johnathan Maxwell
Richmond, VA

Lode Runner: Press CTRL/F for unlimited lives. Do it before you start on level one.
Eric Chan
Dallas, TX

Mail Order Monsters: To make your Morph as powerful as you want and to get as many Psychons as you want, select two-player and tournament modes. Then pick your regular owner for player one. When player two (the ghost owner) has to pick the owner, make a new owner on your owner's disk. Pick the right stuff for both owners. (Do not pick the No Surrender option.) Then when you finally get to the battle ground, make the ghost owner surrender continuously. The more battles you pick, the more Victory Points and Psychons you will have.
Omar Khan
Petersburg, VA

Maniac Mansion: When you go to the door next to the Grandfather Clock, always leave it open. When you go into the kitchen and Nurse Edna sees you, walk forward and keep pressing your button until you get to the open doorway. Then you are safe and can go back in, and Edna won't be there.
Christian Szabo
Address Unknown

Maniac Mansion: To get the key to the Outer Door, use the Tools on the Grating behind the Bushes outside. Then have one of the kids stand beside the Swimming Pool Ladder. Have another go into the now open Grating and turn on the Water Valve, causing the Pool to drain. Have the kid by the Pool climb down the ladder and into the Pool. Hurry back out and have another kid turn off the Water Valve so there won't be a meltdown!
Aaron Maupin
Fresno, OH

Might and Magic: You'll need a pass to see the King, try C-1, 5-7. The man playing his pipe knows the answer to the Lion's Riddle. Don't trust the Winged Beast.
Lance Gater
Address Unknown

Pirates: Choose War for Profit under the historical periods. Then become an English Buccaneer. If you are lucky you will start at one of the islands on the right, and from there you can visit towns on the other islands. When you visit the towns go to taverns and get some men, but remember to keep them at least pleased.
Tung Do
Lansdale, PA

Pirates: If you're unsure whether a governor is hostile toward you or not, march into town instead of sailing. This way, if the forts do fire on you, you won't lose a ship. This is incredibly useful and is the only safe way to find out the governor's disposition.

A quick way to recruit is to go to the tavern, recruit some men, then save the game and shut down and reboot. When you load the game again, you will be able to recruit again without having to wait the normal week or so.
Mike Pendelton
Ventura, CA

Marble Madness: In all levels with the black computer marble, usually he'll knock you off along with himself. But if you escape and you are desperate enough for 1000 points, waste a few seconds for those points. Good Luck!
Tom Heydon
Address Unknown

Plundered Hearts: To get past the crocodile, squeeze the leather bottle on the slab of pork. Feed the slab to the crocodile, and he'll fall asleep in a couple of minutes.
Aaron Maupin
Fresno, OH

Ports of Call: An easy way to become a multimillionaire is to buy the most expensive ship. Then wait until the prices go up and sell. Wait until the prices drop, then buy the most expensive ship you can. Wait for the prices to rise and sell, then wait for the prices to drop and buy again. It takes a long time sometimes, but you can become very rich. I sure did.
Jason Norlin
Address Unknown

Rambo: At the beginning when you're in the forest, if you don't shoot and you keep on moving upwards toward the fort without stopping, the enemy soldiers won't even notice your presence.
Joel Leveille
Address Unknown

Rush 'n' Attack: When you are at the last screen of the first level, (the rockets should be in the background) get a flamethrower. When a truck shows up with the men in it, go to the extreme left of the screen. Wait until the first man is almost at you and fire your flamethrower. If you do this three times, you should only have one man to use your knife on. Also, a rapid-fire module will speed up knife work.
Sean Burke
Burton, OH

Skate or Die: On the Ramp Freestyle, a good move to try is an over-the-channel hand plant. To do this, go to the part closest to the channel (the indented part on the left lip). Drop in, and on the other side do a rock-n-roll, but instead of kick turning out of it, push the button. On the return, do a hand plant as normal, and you should get double normal points. Continue on the right lip and only do airs on the left. Try to push all airs over the channel, and try to be creative with them.
Keith Rains
Duncanville, TX

Skate or Die: When in Downhill Jam you may be caught behind the fence. If you do not want to be shredded just wait. When your opponent goes far enough away you will be automatically teleported to his/her side.
Justin Stephenson
Evansville, IN

Spy Hunter: To gain lives in this game, just get into your boat, go full speed and shoot enemy boats, boats, boats! Caution: Watch out for islands at this speed.
Brennan Soutar
Address Unknown

Summer Games II: In Fencing, push your button and move the joystick diagonally down. When you do this the computer will do the same. Sometimes both you and the computer will get hit, but most of the time you will hit the computer and usually get a world record!
Chad Rowley
Address Unknown

Yie Ar Kung-Fu: When you fight the enemy, do not attack head on. Instead jump around to confuse him. Then when you are really close to him, leg sweep. It takes practice but you can even hit four or five times in a row.
Chris Gioia
Address Unknown

Zork I: Get as many treasures as you can (preferably heavy ones) and confront the thief in his Lair. One by one give him your treasures. Seem strange?

Well for each item you give him, his load gets heavier and heavier, making it harder for him to defend! You will now have a few chances in which to kill the thief.
Alan Barrett
Boise, ID

Zork II: When you get to the first puzzle room (SW of the carousel room), the answer to the riddle is "well."
Andrew Zeitoun
Scarborough, Ontario
Canada

Zork II: To get the key to open the door in the Tiny Room, put the mat under the door and push the letter opener into the lock. This will make the key fall out of the other side of the lock onto the mat. Just pull the mat out from under the door, and you will have the key.
Jeff T. Henson
Mayflower, AZ

Zork III: When in the technology museum, push the gold machine into the Jewel Room and turn the dial to 776 GUE. Sit on the seat and push the button. Then wait for the guards to leave (you will hear a loud crash). Take the ring, and only the ring. Go back into the museum, turn the dial to 948, and hide the ring under the seat. (If you took the other jewels, they will find the ring, and you will not be able to reclaim it). Sit on the seat and push the button. You are now back in 948 GUE. So look under the seat and get your ring!
Eddie Staszko
Mayville, IN

Zork III: When you find an old man sleeping in the Engraving Room, feed him the bread. He will show you a secret door in the wall that you cannot find without his help.
Jeff T. Henson
Mayflower, AZ

Zorro: Anyone who is having trouble getting through the game should keep referring back to the screen with the couch and key. Use the key to get through the door and get the object inside. You will have to use it on another screen to complete your task.
C. Crow
Granville, MA

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mat, selecting the drives to be backed up to and reading the disk after the backup to verify them. These settings may be saved in a preference file for automatic execution upon running *Quarterback*. *Quarterback* can use from one to four floppies for backups. With more than one floppy you will find that your backups go faster because *Quarterback* is working while you're changing disks. The option to read the disks after writing is very important if you plan to save these backups in case of future disaster. You sure don't want to find out that one of your backup disks is corrupt the day you're doing a restore.

While putting *Quarterback* through its paces (backing up my hard drives), I timed a few backups. Here are the results:

Drive:	Fast File System device
Files:	301
Bytes:	2909715
Disks used:	4
Time:	5 mins 32 secs
Verify:	On

Drive:	Normal File System device
Files:	33
Bytes:	165726
Disks used:	1
Time:	0 mins 22 secs
Verify:	On

Drive:	Fast File System device
Files:	301
Bytes:	2909715
Disks used:	4
Time:	2 mins 54 secs
Verify:	Off

Drive:	Normal File System device
Files:	33
Bytes:	165726
Disks used:	1
Time:	0 mins 12 secs
Verify:	Off

As you can see, times double when you use the verify option; you have to decide if this extra peace of mind is required or not. Comparing these times to DISKCOPY (a time of 1 min 37 secs for a normal 880K disk) you see that *Quarterback* with verify is just about equal to DISKCOPY. Now you may not think that this is quick, but if you were to compare *Quarterback* to some other hard drive backup programs available you might feel differently.

Now that we have our hard drive backed up, let's look at the restore option of *Quarterback*. Select the Restore from floppies option; you are then requested to enter the name of the device you wish to restore. Enter the device name; you may have noticed that there is one other option that can be set on this screen—the drive to be used to restore from. This is also the point of my only complaint with *Quarterback*. The fact that you can select only one drive to be used to read from is a bottleneck in the restoration of your hard drive. Of course, that one drive can be any valid drive on your system (df0: – df3:). I think the ability to use more than one drive for restore is a real important requirement (and I hope part of a future upgrade).

You will now see the master menu with all the same options you had for performing the backup. After making the proper selections, you are shown the restore options. Important options include Override existing files, Restore only files which exist and a restoration report. Selecting PROCEED will start the backup. So as you can see, doing a restore of your hard drive (or deleted files) is just as easy as making the backup. One thing worth noting here is that *Quarterback* stores a catalog of all the disks on disk #1. So if you are doing a selective backup of only a few files, *Quarterback* can go directly to the proper disk to find the files to be restored.

> A great feature of *Quarterback* is the ability to back up files that will *not* fit on one disk!

Quarterback stores the information on a non-DOS format. This means that only *Quarterback* can read these disks and their data (but you can use DISKCOPY to make a second set of your data). So if you install *Quarterback* on your hard drive (it's not copy protected), make sure that you keep a copy of *Quarterback* on floppy with those backup disks. You don't want to format your hard drive then go to do a restoration and realize that you misplaced the original *Quarterback* disk.

A great feature of *Quarterback* is the ability to back up files that will *not* fit on one disk! This may not seem important to the casual hard drive user, but the power user will understand the big benefit here.

Quarterback's ease of use, flexibility, multitasking ability and speed make it a tool that no hard drive owner can afford to be without. These features, along with the ability to back up just about any type of hard drive set-up, wins *Quarterback* the most valuable player of the year award in my book. C

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accurate outcome that pits team against team, coach against coach, and man against man in an almost limitless variety of game situations. Basketball, a game of percentages, is fought on many diverse levels to gain whatever slight advantage is up for grabs, and Avalon Hill's *NBA* doesn't miss a beat. Who's guarding whom? How tired is each player? From where is the shot released? How many passes were there before the shot? Where is the game taking place? As amazing as it all seems, all this and more is taken into account on every bounce of the ball.

When both sides have keyed in their chosen strategies, the display switches over to a half-court view of the contest, complete with two full teams moving into position to carry out their designated assignments. The passes, shots and rebounds are all played out in living color. Overall, *NBA*'s animation phase is not up to par with the crispness and fluidity we've seen in other notable releases. Team movement is simplistic, player definition is lacking, and there is little audio enhancement to support the unfolding action.

But to the intense computer coach, it won't matter much. This is a statistical simulation, not a visual reproduction. So what if the ball doesn't swish through the hoop with a realistic snap; it can't detract from the authenticity of the play's result, and that's the aim of the game. With a graphics toggle, you can even shut off the visual phase altogether, a choice that will speed up a contest considerably, without removing any of the satisfaction.

At game's end, stats can be reviewed, printed and even saved and updated on disk. Keep track of all twenty teams if you wish, to see which of the great teams is the greatest over a fantasy season. An "All Computer Quick Play" option will even allow an entire contest to be decided in a couple of minutes, so you can cover quite a few matches in one sitting.

Players who are familiar with the planning and implementation of basketball tactics and strategies will find Avalon Hill's *NBA* an absolute delight, standing alone as the most realistic simulation of big league basketball coaching available for the Commodore. And for those of you previously unexposed or uninterested in the ins and outs of this cerebral sports contest, what better way to become actively involved?

The jury's in, and this court battle promises to be a winner. C

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tions let you print the data to screen or printer. Impressive query options let you selectively recall only the data which matches your needs. Another little plus I appreciated was the ability to dump any screen display at any time.

In the business world data security is a serious concern. To help ensure the information in your data files can be viewed only by those you want to see it, *Superbase Professional* employs passwords. To access protected data the user must input the correct keyboard sequence. This security is important not only to prevent unauthorized eyes from viewing sensitive files but more often to prevent anyone from accidentally (or intentionally) altering important information. I was happy to see that the security check required by the current version of *Superbase Professional* no longer echoes to the screen when entered as it did in early versions.

Data created by *Superbase Personal* can be loaded and recognized by *Superbase Professional* automatically.

If you are a *Superbase Personal* user and want to move up to the professional version, you'll be happy to know you won't have to rekey all your data to use it here. Data created by *Superbase Personal* can be loaded and recognized by *Superbase Professional* automatically. But be aware that this is a one-way trip, once you have upgraded your files they can no longer be accessed by the older program.

Because of the size of the main program a system with one megabyte memory and two drives (preferably a hard drive) is recommended. You can run the program with a bare bones 512K, single-drive system, but you will quickly become disheartened with how often you must switch disks.

Text Editor

The text editor can be used to write letters and reports or anything which would normally be printed on paper or screen. You can use it to import and integrate external ASCII text blocks of any size into your database.

The first rumors circulated about *Superbase Professional* referred to this text editor in terms which made it sound like a full-fledged word processor—it is not. This applications module has some pretty impressive features like word wrap, cut and paste, both insert and overwrite modes, and you can even format individual paragraphs. It also allows you to mix text of different styles (bold, italic, underline, etc.). But its features don't begin to approach those of a dedicated word processor like *WordPerfect*. Instead, the text editor is good for creating and editing short ASCII files to save with your files, merge with a mailing or dump to your printer.

Forms Editor

To be brief, the forms editor performs much like *DeluxePaint II*. It lets you create graphic-heavy forms using the tools selected from a menu: boxes, lines, patterns, text, etc. With these you can easily (using it is more like play than work) design very detailed and visually impressive forms to embrace your data either on screen or when dumped to a printer. The length of forms created here is not restricted to a single screen or printed page, but instead can be any size and contain as many pages as you need.

The text used by the forms editor can include all the standard Amiga fonts. And contrary to what is stated in the manual, text fonts can be altered without deleting the text and retyping.

You are not even restricted to using symbols and tool-created images alone in your forms. You can import and incorporate IFF picture files as well to give your finished data displays or printouts a truly unique and professional appearance.

Programming Language

Perhaps the best thing about *Superbase Professional* is that it is programmable. Because of this you can save yourself hours of work by customizing programs to do the repetitive chores associated with data management. To make this a simple task (providing you are comfortable with programming) *Superbase* comes with its own language called Database Management Language (DML). It is actually an expanded version of BASIC and includes most of the standard BASIC commands and functions plus some specific commands unique to database management.

If you already know how to program in BASIC, you shouldn't have any trouble whipping up your own customized programs for quick data entry and retrieval, but I suggest that non-programmers become thoroughly familiar with *Superbase*'s direct controls before attempting to write a program. A program is simply a sequence of commands which duplicate those you would normally enter via either

the keyboard or mouse.

After you have memorized a command sequence you repeat often, you can write a short program to duplicate it. Because DML operates in direct mode (instructions are executed as soon as you press RETURN) as well as program mode, you can test your instructions before committing them to an actual program. If it is your job to input, update and recall data for your company, you'll really appreciate how much faster and error free your work can be done with a well-programmed database.

DML includes well over 100 commands, and each line of code can contain up to 255 characters. As is true of any language, you must be careful to avoid using system-reserved words and keep track of your variable names. The DML's editor performs much like the one supplied with AmigaBASIC including split windows and pull-down option menus. New programmers will appreciate the sample programs supplied on the Forms/Editor disk. The best way to master *Superbase*'s DML is to load a sample program, run it to see what it will do and then modify it to suit your needs. I've always found I learn quicker by doing a task rather than just reading about it.

After you feel comfortable with DML you may find yourself doing some pretty impressive things with *Superbase Professional*. If you do, don't fail to let the people at Precision know about it. Registered programmers can qualify to receive newsletters, regular technical notes and updates, automatic upgrades and access to their technical support service.

On The Negative Side

As always, there are a few things I don't like about most products, and *Superbase Professional* is no exception. For one thing, I don't like the way the program handles disk access. Rather than letting you simply click on an icon representing the drive containing the disk you want to use, you must pull down a change directory menu and manually key in the new disk or drive name. I assume this unusual interface (for an Amiga) is to ensure you or I don't absentmindedly remove a disk holding the active data file without first saving any changes we might have made.

I also object to having to share a user manual which has dual instructions—for both the Amiga and another system. In my opinion, a program which cost nearly $300 should come with a manual referring *only* to the system I'm using.

> *Superbase Professional* is for those of you who need to put some ''professional'' power in your data control.

Oh yes, lest I forget to mention it, *Superbase Professional* requires a dongle plugged into joystick port two to operate. I for one hate dongles (they are small and hard to keep up with), but I hate copy-protected productivity software even more. The disks themselves are not copy protected, so you can duplicate them as often as you need as well as install the program on a hard disk.

If you decide *Superbase Professional* is the program for you or your company, be sure to register your purchase. In addition to traditional phone support, Precision Software maintains a BBS (Official *Superbase* Information Network) where you phone by modem to download problem data so Precision Software's technical assistants can evaluate your data and pinpoint your specific problem. Anyone who has ever tried to explain a problem over the phone will appreciate the ability to actually show (via downloaded data) the technical people exactly what is not working and have them tell you how to fix it.

More Improvements

Just as *Superbase 64* evolved into *Superbase 128* as time passed, *Superbase Professional* evolved out of *Superbase Personal* and is still evolving. If your version of the program is older than version 2.2, contact Precision for an update; version 2.3 was shipped in June.

If you've read this far, I think you can see why *Superbase Professional* is not a database management system for the occasional user. It is for those of you who need to put some "professional" power in your data control. *Superbase Professional* has everything you would expect or want and is still getting better.

Let me finish with a suggestion: Those of you who use the spreadsheet *Logistix* (which requires a dongle too), may be able to minimize your dongle-tracking hassles by trying the database with that dongle. For my system at least, the two dongles appear to be interchangeable. So I've put one away as a spare and leave the other plugged into my system at all times. (Unfortunately the security dongle which comes with *X-CAD Designer* is different, so I still have to keep track of it). ■

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format for porting over a score to Aegis' *Sonix* and a more sophisticated version of SMUS for porting to *Deluxe Music Construction Set* by Electronic Arts. You can also step up or down all the recorded notes in a track by either a half-step or a full octave. In addition there is an option to load and play a previously-written script of a series of songs (one is provided that plays all of the 13 songs provided on the *HotLicks* disk).

Although *HotLicks* never produced a Guru or a persistent lockup when using any function, there are several aspects of the program that annoyed me. First of all, you cannot "view" your music at all. Although *HotLicks is* designed for people who can't read music, that doesn't mean that we don't want to view music in an alternate form. The method used by *Instant Music* to show music with colored bars is a much better alternative than no graphical representation at all. A problem that really frustrated me was that fact that you cannot record music in either the Chord or Arpeggiation play modes. To make matters worse, if you simply want to "jam" along with a score, the Chord and Arpeggiation modes cease to function. On a similar note, I also found it very difficult to record one of the internal rhythms as a background for a lead track I was going to record (when in Edit mode the internal rhythms do not repeat, and an attempt to use the cut-and-paste capabilities to record as many loops as I needed for a background track failed miserably, as the successive loops did not synchronize with the metronome).

There are a few other features that I would include on a wish list for a revised version of *HotLicks*. One is the ability to play two separate instruments (by using each section of the Amiga keyboard for a separate instrument). Since you can already play in different play modes for each half of the Amiga keyboard, this would be a nice extension of that capability. Of course more instruments and scores would be nice, although because *HotLicks* supports IFF, you can simply pick up extra instruments and scores from the Amiga PD world for use in *HotLicks*.

Although I can't read music, *HotLicks* certainly allowed me to play decent music just with the Amiga keyboard and mouse. Unfortunately I can't say that recording and editing music was as easy. As it is *HotLicks* has promise and should eventually become the premier music program for the beginning Amiga musician. ■

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venture books about the Spaniards who conquered Mexico, Peru, and portions of America during the sixteenth century. My brother Bill and I were constantly discussing those stories as kids, and we wanted to recreate them (in game form) when we became adults.

Jermaine: How did you generate the program?

Bunton: The map used in *Seven Cities of Gold* took a lot of time to develop, and it consumed most of the available memory. I'm really proud of that map because all land masses were drawn to scale, known distances are accurately depicted, and everything exists in its proper location. If you've read the stories of the conquistadors, you know where to look for most of the treasure. We also added something special to the game that can't be found in the history books. Due west of Panama is a hidden island (inhabited by the richest tribe in the Western Hemisphere). The island is completely surrounded by mountains, and the native village doesn't appear on any map. A wise adventurer will accept this challenge because it could quickly make him a wealthy man.

Someone recently asked me why we didn't have controversial stuff like human slavery in *Seven Cities of Gold*. Whether you know it or not, a form of slavery exists in the game. Whenever the player conquers a tribe or negotiates a trade agreement with them, he acquires a number of bearers to carry his belongings. These people are essentially his slaves. Even though some nations (like England) traded with the natives in real life, Spain never exercised that option.

Hernando De Soto (the Spaniard who discovered the Mississippi River) was a particularly nasty guy. He'd usually go into a village, practically decimate the place and take the people he needed to carry his stuff. Those unfortunate captives became members of a "chain gang," where everyone was chained together around the neck. If they didn't do their jobs properly, De Soto had them decapitated on the spot (which quickly deleted them from the group). Let's face it. A lot of terrible things happened in those days. Basically we tried to give the consumer a reasonable simulation of the new world during the sixteenth century where all the gory details had been purposely left out.

It's interesting to note that the original "Seven Cities" concept featured the ability to take sightings on the sun, sail your own ship, establish colonies, etc. All of these notions looked great on paper, but we ran out of memory before they could be used in the product design.

Jermaine: Tell me about your other software projects.

Bunten: When *Seven Cities of Gold* hit the market in February of 1984, it sold very well (even better than *M.U.L.E.*). In fact, over 150,000 product units have been sold to date. Seeing the handwriting on the wall, EA quickly persuaded us to develop a sequel to the program. I honestly didn't want to do the project, because sequels to popular computer games are generally not very profitable (unless they're a special item like *Ultima* or *Bard's Tale*). In those cases, a sequel is basically a continuation of the previous storyline.

Seven Cities of Gold, on the other hand, gave us a unique problem to solve: how could we continue the story of the conquistadors, when everything had been done in the original program? Actually, there was a simple solution to this dilemma. We would simply move things geographically and do a Marco Polo game taking place in Asia or a Stanley and Livingston scenario in Africa. An African theme seemed to be the best choice at the time, so we started things rolling in that direction.

After reading a number of books on the subject, it soon became apparent that we'd made the wrong decision. The conquistadors, on one hand, were ultra-powerful dynamic individuals, while the guys who went to Africa were spreading religion, big game hunting, looking for new species of butterflies, etc. In an effort to save the day, we decided to make our program sort of an African Indiana Jones adventure (where the explorer was looking for a long lost tomb). We were going to have you graphically fighting lions and tigers, facing elephant stampedes, getting leeches all over your body and exciting stuff like that. Unfortunately, memory restrictions prevented us from using any of these great ideas.

Robot Rascals, a futuristic scavenger hunt, was an attempt to create the ultimate computer game that the whole family would enjoy. By making a game that anybody could play we didn't attract special interest groups like role-playing people or history buffs.

Our latest project is called *Dan Bunten's Modem Wars. [**Editor's Note:** This program should be available by the time you read this.]* The program features all the action of football and hockey, except it's football played with tanks, drone aircraft, phasers, lasers, missiles, bombs and other destructive devices. This game can be played by one person at home, or two commanders have the ability to battle it out across the phone line. I've never been so excited about a product because it allows two pals to have a lot of fun together whether they're separated by a few blocks or 1,000 miles.

Freefall Associates, founded by Jon Freeman and Ann Westfall, have developed several top EA Titles *(Archon, Archon II: Adept* and *Murder on The Zinderneuf.)* Here are some behind-the-scenes stories of these games' development.

Archon (1983)

Two unrelated incidents led to the development of the program. First of all, Freeman was the King's Pawn in a living chess match (back in 1968). Whenever opposing pieces met on a particular square, they fought for that space with swords, clubs and shields. When *Star Wars* was released, Jon really enjoyed its three-dimensional chess board scene. Even the product name had a special meaning in Freeman's life: while he was attending college at Indiana University, "Archon" was the title given to the student council.

When it came to selecting the icons for the game, a number of different character ideas were never fully developed. They included: werewolf, serpent, spectre, cyclops, harpie, war lord, griffin and sphinx. Several magic spells also fell by the way side. One of them had the ability to speed up the movement of an icon in battle, an idea, whose concept was vague and was quickly discarded. Another rejected Archon notion was almost used in the game. It would have allowed you to take control of an enemy piece for a single turn. That line of thought was eventually replaced by the spell that summons the elementals.

Archon II: Adept (1984)

The name "Adept" is a fairly common synonym for "mage" or "magician." In ancient times people believed that the world was composed of four basic elements: earth, water, fire, and air. If you look at things in the proper perspective, they weren't very far from the truth. Keeping this in mind, Freeman created a special strategy board displaying defined realms of earth, water, fire and air. In an early version of *Adept,* the siren and behemoth appeared on opposite sides of the conflict. This setup didn't work because the behemoth, sort of a cross between the goblin and the troll in *Archon,* was a slow moving icon in the game. It had to get next to

an enemy piece, in order to inflict damage because it didn't fire anything. There was nothing they could do to prevent the siren from annihilating the behemoth in combat, so Freeman put them on the same side of the board where these pieces would never fight each other again.

Murder on The Zinderneuf (1984)

First of all, the main inspiration for the project was the board game Clue. *Murder on The Zinderneuf* was started in November of 1982 and finished by May of '83. The program contains about 4000 variations, including a huge number of possible crimes, clues, motives, "red herrings," solutions, so on and so forth. Whenever you discover two connecting rooms, the occupants of the rooms are somehow connected in the storyline. These people can be lovers, husband and wife, one individual might be blackmailing the other, etc.

Trivia Question

Do you know the five top-selling EA programs of all time?

The answer can be found at the end of the feature.

My interview with Bing Gordon continues with a review of 1984. Programmer Stuart Smith joined us for the discussion.

Gordon: I remember several interesting things about *The Standing Stones* project. First of all, the packaging artwork was exceptionally well done. It depicted Stonehenge at night and really caught your eye when you saw it on a shelf. The game itself challenged the consumer to explore 15 levels of dungeons beneath the ancient monument in a search for the legendary Grail. In its original form, the challenge was so difficult that none of our testers could get past the first level. This was one of the few times in the history of the company where we had to simplify things substantially before a product could be released to the public.

During the fall of 1984, there was a time when Electronic Arts might have gone under. We were constantly looking at cash projections and expected to run out of money (but we obviously didn't). It's also interesting to note that the competition was experiencing the same problem. Every month you'd read about some video game outfit or software company going out of business. Yes, this was a terrible time for everyone. Stuart Smith's *Adventure Construction Set* also came out during this time period. I'm sure Stuart can fill you in on that particular program.

Jermaine: What inspired you to write the *Adventure Construction Set (ACS)*?

Stuart Smith: In the beginning, I wanted to develop a special adventure-game generator which would allow me to write a number of different adventures without having to start every project from scratch. I also thought there might be users out there who would like to write their own adventure games, but I wasn't really sold on that idea at the time.

In fact, I wanted to do a collection of religious and mythology-related projects called "North, South, East and West." South covered the origins of religion in the Tigris/Euphrates region and Egypt. It actually appears in the *ACS* and was renamed "The Rivers of Light." North would have probably been about Odin and the Norse gods, while West could have covered western Christian beliefs and Judaism. East, on the other hand, was a natural title for examining eastern religions.

All of these projects would have been written as true text adventures. I also had plans to secretly link them together, so you could acquire objects or powers in one game that could be used to go farther into the storyline of another. Each of these special adventures, however, would seem to be complete when you finished it.

Leary thought they could have the same sort of mind-expanding possibilities that he once thought psychedelic drugs would have.

Unfortunately, the full quartet of adventure games never came out, but my contract with EA called for the creation of a single adventure (based on South). Don Daglow, a producer at Electronic Arts, entered the picture about this time. He became the new producer of the project and started looking over my original notes. Daglow soon discovered I had mentioned the possibility of producing an adventure game construction set in the initial proposal (but that idea had been shelved by the other producer). Don had thought about doing something similar himself, so he was more sympathetic to the cause and encouraged me to write the program.

[Editor's Note: Daglow is no longer at EA.]

Jermaine: Did you have many ideas for the *ACS* that never appeared in the program?

Smith: There were lots of them. One idea would have allowed the user to transform himself into any monster before he played the game. Once his mission was completed, the player would have to find a way to change himself back to his original form. We also thought about giving you more spells, the ability to import graphic images (from a special graphics tool), the option to print out an entire adventure (where you could review it on paper), so on and so forth. All of these notions had merit, but we reached a point where the program had to be completed and marketed. *ACS* was the kind of product you could work on forever, continually making it better and better.

The future of the software industry began to look better in 1985. Bing Gordon continues his story by telling us about the origin of *SkyFox*.

Jermaine: What happened in 1985?

Gordon: We released a number of successful programs during that time, but one that immediately comes to mind is *SkyFox*. During the spring of 1984 Ray Tobey attended an Applefest Show in Boston. He was there to demonstrate an animated flying scene he'd put together for the show. Steve Wozniak, the legendary designer of the Apple II computer, walked by and saw it. "Holy Smokes," he said. "Holy Smokes!" He took out his business card and wrote on it "Trip, this is the finest game I've ever seen on an Apple. Woz." Ray Tobey was so excited, he had Wozniak's card encased in plexiglass for safekeeping. A year later, this amazing animation sequence had evolved into what we now call *SkyFox*. A sequel to that program was recently released, and it's presently selling very well.

Jermaine: What came out in 1986?

Gordon: Timothy Leary is popularly known as the "Guru of LSD." He was a renowned psychologist (during the '50s and '60s) who created a new type of personality-profiling questionnaire. It was used by institutions, government job-testing facilities, schools, etc., across the country back then. Because of his work in prisons, Leary got involved with the drug LSD. Scientists initially believed it was a new way to do personality research. They used it on prisoners, Leary tried some himself, and the rest is history.

We contacted Leary because he had become interested in computers. Leary thought they could have the same sort of

mind-expanding possibilities that he once thought psychedelic drugs would have (without any kind of negative side effects).

When the going gets weird, the weird turn pro.

So we called him up and set things in motion for him and a programmer to develop *Mind Mirror* (a program based on some of the personality profiling research Leary had done in the past). Timothy Leary's *Mind Mirror* program came close to being rejected because Leary had a very liberal sense of humor. We were also afraid that the language might be a bit too racy for the average EA customer, so he went back and toned it down a little.

Amnesia also hit the market during that time frame. I visited its author (Thomas M. Disch) at one of our first artists symposiums. We talked about the publishing business for a while, because Tom is a well-known science fiction writer. Then I asked him a more personal question: "What single image really stood out in your mind as you wrote the *Amnesia* text adventure?"

He said, "For me, it was the white silk wedding hat. It seemed so inappropriate for anybody to be walking around the streets of Manhattan, wearing an all-white tux with a white silk top hat."

Jermaine: What do you use to write your software today?

Gordon: Artists who develop for Electronic Arts are equipped with a specially designed portable workstation for program development. The Artist Workstation (AWS) consists of an IBM/AT or 80386 computer, two to four megabytes of memory, and a proprietory cable that links the IBM to the "Target" computer. EA developed propriety software for the AWS including programming languages; editors for music, sound effects and graphics; and programming tools such as a symbolic debugger. The computer enables them to make adjustments in real time. This special tool maximizes development efficiency and improves program quality.

Jermaine: Can you give me some information about the EA loader?

Gordon: It was designed by Meynard and Hayes in April of '83. I thought it was really cool because there was our company logo, going through a progression of beautiful color changes. The software theft protection in the loader has probably been rewritten 30 times.

Jermaine: Would you explain the company philosophy?

Gordon: It's really very simple. When the going gets weird, the weird turn pro.

Jermaine: Who introduced Nerf™ Balls to Electronic Arts?

Gordon: Trip Hawkins originally brought them in during May of 1983. He thought they would relieve stress and everyone would have a lot of fun with them. Whenever we hear someone yell "Nerf Alert!" around here, everybody grabs a ball and starts looking for an easy target to nail. To show you how much we're into this kind of thing, EA presently has 200-300 Nerf Balls on order.

Jermaine: Have the EA artists changed very much over the past five years?

Gordon: I would say they've changed quite a bit. On the average, most of our development people are about 30 years old (while five years ago, they were around the age of 20). The average program we're currently selling on the market has approximately 18 months of development time in it. Back in 1983, we worked six to eight months on most of our software projects. The artist of today usually has computer science degree(s), where he learned programming on his own in the past. I guess you can see we expect more from our people today, and it's a lot harder to be an EA artist these days.

Marble Madness, another popular 1986 release, was Electronic Arts' first and only arcade game replica. I would now like to introduce you to Mark Cerny, my special guest for this project. He is currently working for Sega Enterprises in Japan, but several years ago, Mark was a member of the *Marble Madness* coin-op design team. Our recent interview revealed how that project came together, which set the standard for the EA programmers to imitate.

Don't be afraid to try a lot of different things because we've got a few "Easter Eggs" hidden out there.

Jermaine: What led to the development of *Marble Madness*?

Mark Cerny: There were actually two things. First of all, we wanted to create some good looking 3D graphics. It's really hard to generate clean looking three-dimensional effects in a coin-op environment, so we decided not to go all the way to 3D (which meant we would not be using perspective in the picture). The decision was made to engineer a simple side view (technically called an "orthographic projection") which basically gave us the illusion of 3D without all of the technical problems associated with it. I also wanted to do something similar to miniature golf. Another coin-op company had already done a mini-golf game, so we came up with a whole new concept (where the player continually controlled the ball as it moved towards a goal).

We used the Atari System One (general purpose hardware) to develop the *Marble Madness* coin-op game. Since the hardware wasn't "dedicated" to our particular needs, there were a lot of things we wanted to do, but simply couldn't do under the circumstances.

The original concept outlined 4½ waves of obstacles. We eventually put our heads together and expanded that number to six rounds of waves. It really became a chore to come up with new and exciting challenges that were also technically feasible.

In the original concept, the ball was going to be a clear marble, while the enemy would have been a "steelie." Using that approach our people would have created a perfectly reflective mirror ball (actually showing the reflections of what was around it) and a nice looking glass ball displaying a distorted version of what was behind it. Yes, these graphics would have looked great on a coin-op machine, but again, the limitations of the hardware forced us to drop both ideas entirely. I was very disappointed.

***PHM Pegasus* was one of the top-selling programs of 1987. Designer Noah Falstein, a member of Lucasfilm Games design team, recently revealed a number of its secrets.**

Jermaine: How did you come up with the idea for the *Pegasus* game?

Noah Falstein: We decided to do *PHM Pegasus* because we were experimenting with a new method of game design, and the group really wanted to create something special (that would please the majority of our audience). Military vehicle simulations were very popular at the time, so I concentrated my research on that particular area. After looking over a number of books, I came to the conclusion we could generate an excellent hovercraft or helicopter program. I found out about hydrofoils (like Pegasus) strictly by accident. A book on hovercraft revealed that there was such a thing as a military hydrofoil. After looking over the material, it

seemed to be the perfect subject matter. The project was started in April of 1986 and completed in January of '87.

Jermaine: Did you ever consider adding enemy aircraft to the simulation?

Falstein: Sure we did. It was simply a matter of time constraints that prevented us from adding them to the game.

Jermaine: Does your simulation of the Pegasus handle realistically in the water?

Falstein: That's a hard question to answer. The actual turning radius of the ship, for example, was classified information. We developed our version of the turning radius by studying pictures, gleaning a few facts and asking people who had seen hydrofoils in action if it seemed to be correct. All of them said our turning radius was very close to the real thing. When all was said and done, we had to simulate a number of things by following this simple procedure.

Jermaine: Tell me about the development of *PHM Pegasus*.

Falstein: There seems to be some confusion whether the hydrofoil pictured on the box is actually the Pegasus with the number "2" air brushed on, or its sister ship the Hercules. The real Pegasus was the first of its class, which automatically gave it the number one. Some EA people told me the craft in question is the Pegasus. They said the "2" was added because the number "1" was too fuzzy to use. I'll never understand why they didn't just touch up the "1" instead of replacing it with a "2." Mark Thomas, a member of the Hercules crew, examined the box and came up with the same conclusion. But even he and the crew of the Hercules weren't sure, so nobody seems to know exactly which one is pictured on the cover. By the way, the PHM Pegasus was in drydock during the months we programmed the game.

Recently Michael Kosaka had a lot to say about *Skate or Die*.

Jermaine: Where did you get the title for the game?

Michael Kosaka: It was derived from the lingo skaters use. We tried to keep everything in the program (including the language) as authentic as possible. In one segment of the program, for example, the player can jump on the hood of a cop car (which automatically activates the siren). Skaters call this maneuver "cherry top fly by." Even though it's fun to do on the computer, we don't recommend doing this sort of thing in real life.

Jermaine: Can you share some tips for playing *Skate or Die*?

Kosaka: In the downhill race segment of the program the best way to explore the area is to simply jump over everything in sight. Don't be afraid to try a lot of different things because we've got a few "Easter Eggs" (high point bonuses) hidden out there. As you compete in the halfpipe event, try to perform every trick at least once. A special bonus score is awarded for doing a variety of these stunts. When you participate in the downhill alley fight scenario, there's a secret path through one of the buildings. Look for it shortly after the first cyclone fence.

Wasteland was the first EA product to receive a PG-13 sticker.

David Albert was the producer of *Bard's Tale III: Thief of Fate* and *Wasteland*. We recently discussed these interesting 1988 releases.

Jermaine: Tell me about your projects for Electronic Arts.

David Albert: Right now, the *Bard's Tale series* includes probably *the* best looking state-of-the-art (sword and sorcery) role-playing line on the market. All role-playing games are basically exercises in resource management. *Bard's Tale III* and *Wasteland* are no exceptions to the rule. A wise player lives by the following code: use what you have wisely, know your current strengths and weaknesses, and taking one step too many when exploring a dungeon will usually be fatal.

When you go to the guild in *Thief of Fate*, type in the word "burger" as you speak to the review board. The user will definitely get a surprise when he does this. *Bard's Tale III* also contains a new save option and an automatic mapping feature. I was pleased with the fact that both products handle gender pretty well. You won't assume a female role, for instance, and see a picture of some guy.

Wasteland is a fairly violent program, that was the first EA product to receive a PG-13 sticker. We didn't have to use the sticker, but everyone felt it was necessary. The game itself takes place in a post-nuclear war holocaust environment somewhere in the Southwest where everyone has access to grenades, machine guns, portable rocket launchers, etc. We also made it possible for other people to join your party, but they don't always do what you want them to do. This "X" factor causes a lot of trouble in the game and supports the illusion that everything is really happening to the player.

Jermaine: What can you tell me about upcoming Electronic Arts software releases?

Albert: I think it's safe to say there will probably be several sequels to existing titles. You can expect another *Bard's Tale* sequel in the near future.

Trip Hawkins, the president of Electronic Arts, would like to tell you his version of the company history.

1982: We developed a strategy for the creation of a new software company. At first I named the new company Amazin' Software. But after a few days of answering the phone that way, there was a near mutiny, and we decided we needed a classier name. We had our first annual retreat at Pajaro Dunes, California, and in one night we renamed the company. The rules were everyone got a vote and it had to be unanimous. If you went to bed, you lost your vote. We settled on Electronic Arts at 2:00 a.m. Semi-finalists were Soft Art and Electronic Artists.

Many of those key founders are still with the company today. They include: Tim Mott, Bing Gordon, David Maynard, Steve Hayes and Jeff Burton. We also signed up our first software artists that year (Jon Freeman and Anne Westfall from Freefall Associates and Dan Bunten from Ozark Softscape).

1983: We finally convinced Bill Budge to sign with us, and the first thing we did was start the Commodore 64 version of *Pinball Construction Set*. We committed to developing several 64 products early in 1983. Even though hardly any disk drives had been sold at the time, the venture paid off. *Archon, M.U.L.E.* and *Pinball Construction Set* were among our first Commodore 64 titles (released in October of that year). We all loved the first advertisement with the software artists ("Can a computer make you cry?"). Reading that ad always makes me misty. It really captures what I've been doing for the past 15 years and why we're all here.

We were heavily criticized by our competitors for our "foolhardy strategy" to sell to retailers ourselves rather than through distributors. As a result, we worked hand-in-hand to grow along with other start-ups like Electronics Boutique, Babbage's, Egghead Software, etc.

One of the highlights of my life was in June, when I got to shoot baskets with Julius Erving at the San Mateo YMCA. Bing Gordon asked Dr. J how many times

he would win if he really went one-on-one with Larry Bird ten times. Julius gave his best look of astonishment and replied, "I think that if I went one-on-one with Godzilla, I would win most of the time."

1984: I got first wind of the Amiga at a secret demonstration during the Chicago CES (Consumer Electronic Show) in June. Jay Miner gave the demo. The machine was a huge bread board unit, with a zillion wires sticking out everywhere. You could tell it was really the first audio/visual home computer.

We also released *Dr. J and Larry Bird go One-on-One, Seven Cities of Gold,* and other great 64 titles that year.

1985: *SkyFox* was a real labor of love. Ray Tobey rewrote the entire Apple II program. The graphic art, sound effects, speed of animation, and tightness of performance were stunning. *SkyFox* was not only a big hit, but it was also our only new title for the whole summer. It really carried the company through a tough period.

We shipped one of my personal favorites in October: the 64 version of *Touchdown Football.* I played that one to death. We also released *DeluxePaint* and other programs for the Amiga in December for an exciting Amiga Christmas.

1986: *The Bard's Tale* was our first serious foray into role-playing games, and boy were we onto something. It's still the only role-playing game that I've played all the way to completion. I was seriously addicted to the program.

We were all very disappointed when Dan Bunten's *Robot Rascals* didn't sell better. It was so creative that people were afraid to give it a try. But it still ranks as one of the most innovative games we've published to date. It was superbly engineered.

1987: We established a new EA company in England to serve the European marketplace, and they quickly discovered a huge number of Commodore fans. *PHM Pegasus* and *Chuck Yeager's Advanced Flight Trainer* showed that we could publish some pretty terrific simulations. We were delighted with *Skate or Die,* the first effort of our in-house games group.

1988: Already in 1988, we've seen some pretty impressive Amiga entertainment titles(like *Ferrari Formula One* and *F/A-18 Interceptor*). We will continue to support the Amiga, especially in the desktop video market. Where *DeluxePaint II* and other products have been so successful, we really believe that the desktop video market will eventually rival the desktop publishing market, and Amiga is still the leading machine for desktop video.

The Commodore 64, despite its veteran status, is still a vital format. There are many active customers who want software in the United States, and there are still people buying the 64 for the first time in Europe and Australia. The 64 continues to be a major format for entertainment titles. I've been personally working on *John Madden Football.* We're hoping to have the 64 version of the product out before Christmas.

In conclusion, I'd like to thank the people at Electronic Arts for contributing to this unusual project. I wish I could have interviewed each and every one of them.

***Here is the answer to the trivia question, counting backwards from the fifth best seller: (5)* Chuck Yeager's Advanced Flight Trainer, *(4)* Music Construction Set, *(3)* Pinball Construction Set, *(2)* SkyFox II and *(1)* Dr. J and Larry Bird Go One-on-One.** C

Chess: A Computer Mate

Continued from page 73

Watching the computer "think" is probably the most fascinating feature of all of these programs.

Stepping through historical games using a computer and color monitor to see the moves makes a better visual learning impression than reading chess notation in a book. The games themselves go back as far as 1834, through the Bobby Fischer era and into the 1974-to-present Karpov–Kasparov Russian domination in the chess world. Finally, the four-disk set on *Bobby Fischer's Chess Career* includes all of the 777 games of Fischer's entire professional career.

Sharpening Your Talents

The second chess software category includes all software used to play chess on a single microcomputer, usually in the comfort of one's home. In addition to the *Coffeehouse Chess Monster,* there are many other opponent programs. Noteworthy programs are *Sargon III* (developed by Hayden, distributed by Spinnaker) and *Chessmaster 2000* (developed by Software Country, distributed by Electronic Arts).

These two programs have withstood the test of time. Chess buffs who watched the Public Broadcasting System replays of the Karpov–Kasparov games over the years will remember both *Sargon* and *Chessmaster* being used to anticipate the next move of each player.

Still another system is *Colossus Chess IV* (Rainbird Software, Inc.). Analyzing these three pieces (and any future releases) is best accomplished by discussing their features. Main features include (1) challenge potential and levels of play, (2) technical correctness, (3) opening library of moves, (4) player versus computer or another player option, (5) time clocks, (6) taking back moves, (7) saving and printing games, (8) viewing the computer "thinking," (9) problem-solving mode, and (10) collection of historic games.

The most important feature is the ability of the software to challenge players. Without the ability to challenge improving and demanding chess players, chess software would be just another video game. One measure of how competent the software is depends on the skill level of the best player who can be beaten by the software.

Serious human chess players obtain USCF-sanctioned numerical ratings that increase as players improve and play against more challenging opponents. For example, Gary Kaskparov, the best player in the world, has a rating of 2750. Yassar Seirawan, the top U.S. chess player, has a rating of 2706. "Experts" hover between the 1800 to 2000 mark, while most of us would be around the 1000 level.

Levels of Play

While none of the software companies promote "ratings" for their products, it would be a safe estimate that, at the highest levels of play, all of the above four "opponent" software programs have an approximate rating of 1800—better than 95% of the people who know how to play chess.

This ability to play challenging chess is a result of the levels of play designed into each program. The levels of play themselves are really controlled by changing the time allowed for the computer to search all possible future moves from the

given position. As an example, allowing the computer only five seconds to determine its next move would result in a less powerful move than if the computer had five hours to search for the next complete line of moves that would lead to a win.

Sargon III has nine levels of play, ranging from five seconds per move to ten minutes per move at the eighth level. A "No-time-limit" ninth-level move allows the computer to come up with a sequence of moves that will lead to "Checking" its human opponent.

The *Coffeehouse Chess Monster* has eight levels, starting at 18 seconds per move for the beginner, going to about 30 seconds per move for the intermediate player, and concluding with a "no-limit" time selection. The *Monster* also features a "Blitz Chess" option, where only five minutes is allowed for the *entire game.*

Players can actually observe the on-screen flashing of 300 moves-per-second, as the computer analyzes "Check" winning lines.

Chessmaster 2000 sports a whopping 19 levels of play, ranging from five seconds per computer move, to an infinite amount of time until a "Check" sequence is found. And the *Colossus* program touts "thousands of levels of play," because it permits the user to set the exact time for each move, up to an "infinite time" mode.

A second important feature is that chess software must be technically correct, include at least minimum pawn promotion, castling and en passant, as well as preventing incorrect moves. All of the above-mentioned software programs have these features.

Challenge to new or experienced players is improved if there are "stock" opening moves in the computer program database. *Colossus* has an opening book of 3000 moves, that vary from two ply to 17 ply (see Chess Dictionary) deep. *Sargon III* claims an opening library collection of 68,000 Grandmaster moves that proceed along deeply analyzed variations. Because of this extensive opening library, the *Sargon* disk must be kept in the computer during the entire game. *Chessmaster 2000* touts an opening library of over 71,000 moves. Opening "books" are also part of the *Coffeehouse Chess Monster.*

All of the programs allow player-versus-player, player-versus-computer or computer-versus-computer options. And all of the software mentioned allows saving and printing games, as well as allowing moves to be taken back. All four also provide problem-solving sections, quizzes and a selection of historic games to walk through.

Watching the computer "think" is probably the most fascinating feature of all of these programs. Players can actually observe the on-screen flashing of 300 moves per second, as the computer analyzes "Check" winning lines. Again, all of the mentioned chess software programs have a variation of the "view-the-thinking" option.

But there are also differences in these chess programs. *Chessmaster 2000, Colossus IV* and the *Coffeehouse Chess Monster* all provide clocks for play timing. *Sargon III* provides 45 classic chess problems for analysis, while the others have fewer problems for study. *Sargon* and *Chessmaster 2000* allow joystick control to move the pieces. The *Monster* will set up any positions that are being studied in any of the Living Chess Library tutorials. *Sargon* allows users to set up piece layout on the board for customized learning. Both *Sargon* and *Chessmaster* provide discount membership in the USCF.

Chessmaster offers a spectacular alternative to chess board viewing—a 3D mode. In this mode, the user can also turn the 3D board 90 degrees to see every angle. The view is spectacular. However, stepping through a game, playing against the computer or a human is easier in the two-dimensional mode.

Which is Best?

At this point the logical question to ask is, "Which program is the best?" If you read the promotional literature or advertisements of each software publisher, you will obviously get four different answers. Moreover, each of the software packages has been used to play against the other, with a variety of results—a fact also highly publicized. *Sargon III* claims to have beaten a chess master rated over 2200.

So again, "Which is the best?" Elley summarizes the answer succinctly: "Personally, I never met a computer chess program I didn't like. Not all of them are good for all purposes, but each one has something to commend it. For example, I use *Sargon III* to produce chess board graphics. I use *Chessmaster 2000* to analyze positions. I find *Sargon III* and *Chessmaster 2000* to be about equally strong in chess strength. *Chessmaster 2000,* being the newer of the two, seems to have more features."

Still another chess player has the following viewpoint: "I have used three programs on my Commodore 128 but in the rapids mode only. Having played many rapids games against all three, I rate them in this order:

1. *Coffee House Chess Monster* (by far)
2. *Sargon III* (slightly ahead of 3)
3. *Chessmaster 2000* (close to but distinctly behind 2)

But remember," cautions the speaker, "my USCF rating is only 1831."

The "best," therefore, is in the eye of the beholder—and depends on features needed. All four are strong packages. And some packages may even be made stronger. Spinnaker is working on a *Sargon IV* for the Macintosh, but is not planning to port it to the Commodore machines. I think there are enough chess players among the eight million Commodore users to convince them otherwise.

In Any Weather

The third category of chess software involves telecommunications, but connect-time expense to a centralized database is not required. In this category, S&S Software (Mexico, MO) takes the lead with their *Telegames* series—a three-volume set of disk games that includes chess as well as computer versions of Connect Four, Battleship, backgammon, checkers and Yahtzee. ***(Editor's Note:*** Telegames *was reviewed in the February 1988 issue of* Commodore Magazine.) In all game volumes, users receive *two* disks—one for themselves and one for their favorite opponent.

"The program was written initially for a handicapped friend," according to S&S president Tom Stuart. For inexpensive chess games over the telephone, the S&S Software is an excellent and economical buy at $9.95 for two disks. Operation is straightforward with instructions on the disk. Moves are made on each end of the phone line. Players can communicate with each other as in regular telecommunications, even while the game is in progress, regardless of which player is to move. There is, however, no software control to prevent incorrect moves.

Telegames also allows users to set up chess with two users at the same computer. The popularity of *Telegames* is increasing. Stuart says, "After we make initial shipments of product to a particular town, we quickly see more orders from that town."

LINCing the Chess World

Category four—national and international chess networking via telecommunications—displays the most significant advancement to chess-play and chess software in the world. Within the last year, the chess community has been excited with the development of the Leisure LINC—an international, computerized chess club.

"The LINC will revolutionize chess in the U.S. In fact, it is already doing so." —Dunne

According to Alex Dunne, National Master in both over-the-board (OTB) and correspondence chess, English teacher and writer for *Chess Life Magazine,* "The LINC will revolutionize chess in the U.S. In fact, it is already doing so. Where else could you play two 'simuls' (see Chess Dictionary) a week in the comfort of your home—one of them with Yasser Seirawan, U.S. Chess Champion?"

"Right now," continues Dunne, "the LINC is the strongest chess club in America. It offers access to news and personalities that *never* have been available to so many people in so short a time! As weeks go by, more and more of the big names in chess join the LINC."

But the LINC is for all levels of expertise, from beginners to Grandmasters. Elley also comments, "The LINC is the most exciting thing I've seen in all my years in chess. The LINC is sort of an electronic chess club. Anything you can do at a regular club, you can do on the LINC—play chess, meet new chess friends, swap ideas, get information.

"And it's the information part that's truly exciting," Elley says. "Just recently, LINC subscribers were able to re-create a game between the world champion and his fiercest rival only hours after the game ended.

"We've seen debates over national issues, obtained news reports on events all over the world, and witnessed conversations between some of the most interesting personalities in the field. And the LINC really draws the chess community together. I'm currently pursuing four projects in chess, all of them greatly aided by the fact that I have close, easy access to important people in chess. And I see only more potential for the LINC," Elley adds.

LINC has a multitude of features for chess players. A recent user poll rated the features in the following order of interest by LINC members: (1) Postal tournaments/ladder, (2) chess in general, (3) blitz chess, (4) newsroom, (5) mail/conferencing with friends, (6) other games, (7) Sunday speed tournaments, (8) LINC-master events (i.e., simuls) and (9) watching games. One of the most important features of the LINC is that people can watch exciting blitz games (see Chess Dictionary) in progress.

Other games on the LINC include backgammon, GO, Reversi, blackjack and a sports network.

Commodore Support

According to Bill Miller, president of the LINC, support for the Commodore community is new to the LINC. "We now provide software for Commodore users and have made this software available primarily through the USCF. We realize that the Commodore market is a very big market. In fact, we now have a Commodore programmer who is constantly upgrading our Commodore package."

The Commodore *LINCWARE* is a telecommunications software package that offers graphics for chess and other game play. It allows moves to be made and seen on the screen. Version IV of the Commodore *LINCWARE* was released in August; it incorporates disk capture, print capture and a mail preparation facility enabling users to produce letters off-line and upload them.

Users who don't have the special LINC software to get the graphic boards can use any telecommunications software. What you will get for the game boards is the boards' layout with the chess notation for each piece in its correct position. Users can access text information as well as play live games, or even watch games being played. Anyone can get on the LINC with any terminal program. Most people use the specialized *LINCWARE* only when they are actually going to play.

"Although Q-Link has better chess graphics from a Commodore viewpoint," adds Miller, "we have focused on a more competitive style of multi-player games. We have a system that is geared to fast play. The graphics are fast, the computer keeps track of all the timing. We have clocks that show how much time you have remaining. Q-Link and other services just don't have this."

On the LINC, beginners can learn or take lessons on-line from leading chess players. The system is designed to adequately handle the needs of players from all levels—from the mildly interested to the best Grandmasters. There is everything from chess journalism to simultaneously-played games. Anyone—even beginners—can elect to play a top chess player—a Grandmaster, International Master, or National Master—in the simuls. Everyone plays the excellent player at the same time.

Miller adds, "We have been primarily focusing on chess, although we have other games available. Last year we held the first USCF-sponsored chess tournament by computer. We had cash prizes. This year we are holding the International Board Game Championship. We have $5000 in prizes we are offering to the winner. We have some fairly significant prizes."

LINC also provides an automatic rating system for the players. As soon as players finish a game, ratings are instantly adjusted. The tournaments and ladders are all automatically programmed, so that they update immediately. The whole system is designed for people to play a friendly game of chess, to play competitively, or to be paired up for quick play.

The chess part of the LINC network works closely with the USCF. The American Checker Federation backs the checker part of the system. Miller notes, "Were going to get affiliation with our other games. We will have a major sports service backing up. We do the computer part, so we have the USCF helping to back, to organize and to help run the chess tournaments."

Tournaments Abound

At the beginning of every month there is a new postal tournament. When players register for the tournament, the computer automatically allocates five players per section. Players make their move, then sign off. The next day a player's board will come up with the opponent's move on the screen. Then the next move is made and players sign off. It's "postal" in the sense that you take time between moves. But rather than sending electronic messages or regular mail, you actually see the board with the new moves made. Then you can study your move off-line, sign on and make your counter move.

Miller notes, "We have a large postal or correspondence community that doesn't send postcards; their boards are on the service. Then every Sunday night we have a chess speed tournament blitz over the board. Then we have the more sanctioned kinds of tournaments, like this USCF-sponsored World PC open.

"Our service," Miller continues, "sup-

ports the chess aficionados who really enjoy the competitive aspect of chess. We appeal to the more serious chess player. If you are really interested in chess, you should be on our service. We don't charge a fixed monthly fee."

Access to the LINC is 24 hours a day. There are four ways to access the LINC: Telenet, Tymnet, WATS lines (the most expensive way), or the direct dial number—which is $2.95 per hour. Charges are based on access method. In the evening, if you access through Tymnet, the charges are about $4.95 an hour with a local Tymnet node, but in the day, the same access is about $11.95 an hour. The Tymnet charge is built into the cost. Telenet was recently added to the access network.

Q-Link chess utilizes a graphic screen and allows players to communicate with each other during the game.

Chess Federation Support

Don Maddox, Editor-In-Chief of *Chess Life Magazine,* was one of the pioneers of LINC and is a major force on the LINC. *Chess Life* is the official publication of the United States Chess Federation (New Windsor, NY). According to Maddox, "About 30% of material and leads for *Chess Life* are obtained from the LINC network, including connections with columnists, USCF press releases and policies. In addition, the USCF has a working agreement with the LINC allowing the USCF use of the LINC for a number of official purposes."

The USCF sponsors a team on the LINC to play matches against other teams worldwide. The USCF team has played teams from Mexico, Australia and England—all on the LINC.

Maddox is a visionary. "What I am hoping is that every state chess association in this country will be on the LINC. When that results, we will have an impressive information exchange network. Local state association magazines will publish international games more quickly than they do today. The LINC will become the primary source of information on the state level."

Today, there are still a few problems to work out. LINC OTB play for USCF-sanctioned ratings is not yet possible, because the players are unsupervised in two different locations. However, LINC postal chess will be officially rated, because there will be no difference in terms of access to referenced materials as in a regular postal match. The LINC's rating system is structured similarly to that of the USCF.

Ratings are separate for postal and OTB chess. Postal chess is an arena of very diligent research chess players. Postal chess games are started every month and take about four to six months to complete online. The advantage here is that traditional postal (through the mail) games normally take two to three years to complete.

Maddox further notes, "The chess community is very lucky to have the LINC. I spent a couple of years looking for some breakthrough in the chess area on some other computer services, but to no avail. Because the LINC will expand into other areas of recreational activities, its success or failure will not be solely based on the chess community. Therefore, the growth in the chess area will be stable."

International Chess Online

Maddox is in contact with a number of international players and organizations. He predicts that the LINC will quickly expand internationally, not for individual users so much, but for organizations overseas. United States chess teams are already able to play chess clubs halfway around the world. This technique is certainly cheaper than having the clubs travel to various international sites. The cost from overseas is about $10, whereas the cost in the U.S. is about $5 an hour. "Therefore," argues Maddox elatedly, "the USCF team can play an Australian team for $30 from my own house."

There are presently over 60 countries that can access the LINC via Tymnet. Maddox notes, "Over the LINC, I have already had consultation matches with Sweden, Denmark, England, Columbia, Germany, New Zealand, Mexico and Australia. These consultation matches originate from a team member's house. It becomes a social event."

Already the LINC has served as the battle ground for modern-day chess. The Amateur Team Championships were run on the LINC, as were matches between Australia, Canada and New York.

Q-Link

Q-Link, a service more familiar to the Commodore community, also provides a chess forum. George Forsythe is host of the Q-Link chess forum. From his Manhattan home George runs the chess section of Q-Link, including contests and tournaments. Prizes for tournaments include free access time. Q-Link chess utilizes a graphic screen and allows players to communicate with each other during the game.

There are some differences between the LINC and Q-Link. Q-Link has not established a chess clock. This is a tremendous problem. Leisure LINC has an on-line clock. You can carry on a running conversation at any time on Q-Link. However, in the LINC you must wait until it is your move before you can go into conversation mode.

Q-Link allows illegal moves, while the LINC does not. Q-Link allows moves to be taken back; the LINC does not. Ratings on Q-Link are hand calculated according to the old (pre-1980) USCF rating system.

There are no Grandmasters on Q-Link—only beginners up to experts. Whereas the LINC is available 24 hours daily, Q-Link is only on from 6 p.m. to 7 a.m. local time and is not accessible 24 hours. This can cause some problem with east coast vs. west coast games. C

Companies mentioned in this article:

Chess Life Magazine
186 Route 9W, New Windsor, NY 12550
(914) 562-8350
Don Maddox, Editor-in-Chief

Electronic Arts
1820 Gateway Drive, San Mateo, CA 94404
(415) 571-7171
Chessmaster 2000

Enlightenment, Inc.
P.O. Box 20937, Piedmont, CA 94620-0937
(800) 621-0851 ext. 100
Living Chess Library

Rainbird Software
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(415)-329-7600
Colossus IV

Leisure LINC
Four Seasons Executive Center
Building 9, Terrace Way, Greensboro, NC 27403
(919) 855-3491, (800) 826-9688

S&S Software
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(314) 581-5592
Telegames, $9.95

Spinnaker Software
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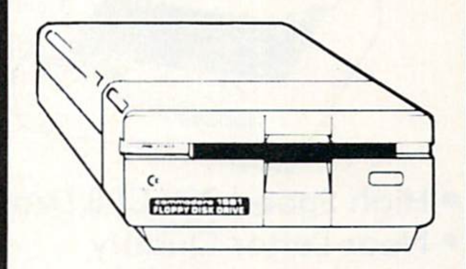
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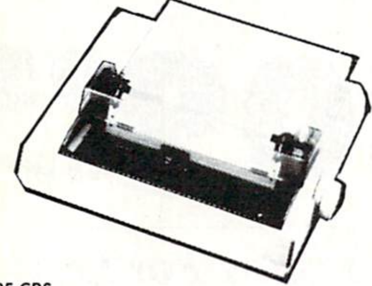
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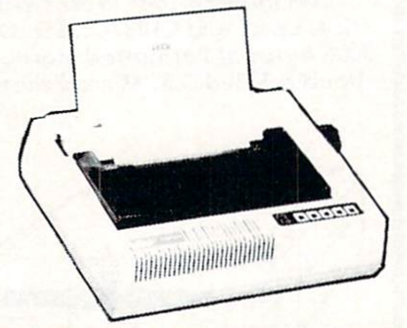
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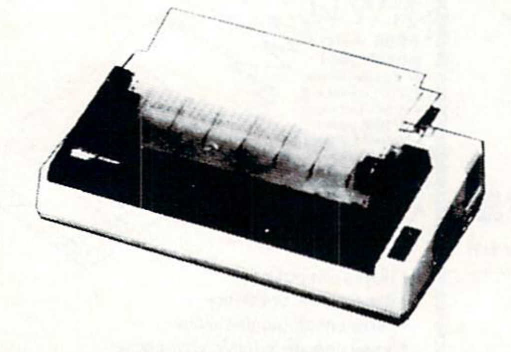
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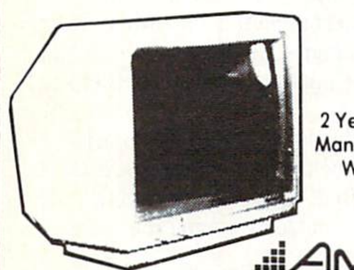
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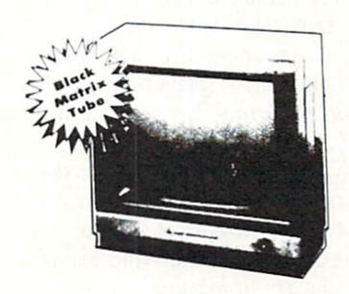
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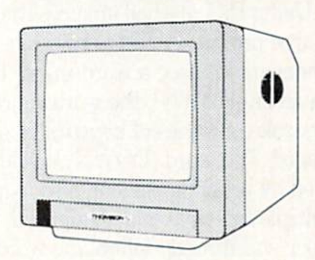
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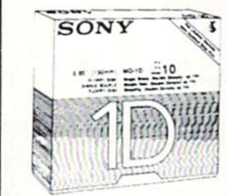
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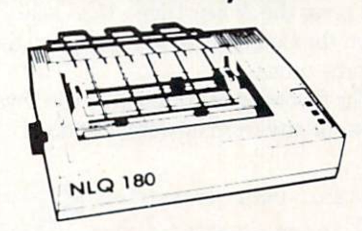
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VISA — MASTERCARD — C.O.D.

The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN, RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice. Note: Do not enter the commas.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

SYNTAX ERROR

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270", type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parenthesis. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the "wrong" line to look at. If the line the syntax error refers to has a function call (i.e., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

ILLEGAL QUANTITY ERROR

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

OUT OF DATA ERROR

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

OTHER PROBLEMS

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than 80 (or 88) characters on one line. You can enter these lines by abbreviating the commands when you enter the line. The abbreviations for BASIC commands are on pages 133-134 of the VIC 20 user guide and 130-131 of the Commodore 64 user's guide.

If you type a line that is longer than 80 (or 88) characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed (without a line number). Many people write that the computer gives them a syntax error when they type the line, or that the computer refuses to accept a line. Both of these problems are results of typing a line of more than 80 (or 88) characters.



THE PROGRAM WON'T RUN!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is "running". Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

IF ALL ELSE FAILS

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program. The user group may also have the program on a library disk and be willing to make a copy for you.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase you understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing (if possible)

All of this information is helpful in answering your questions about why a program doesn't work. A letter that simply states "I get an error in line 250 whenever I run the program" doesn't give us much to go on. Send your questions to:

Commodore Magazine
1200 Wilson Drive
West Chester, PA 19380
ATTN: Program Problem

Have fun with the programs!

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

The Magazine Entry Programs on the next pages are two BASIC machine language programs that will assist you in entering the programs in this magazine correctly. There are versions for both the Commodore 64 and the Commodore 128. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49900 (4864-5545 on the 128) and just lets you know that the program is running. If everything is ok, the program will finish running and say DONE. Then type NEW. If there is a problem with the data statements, the program will tell you where to find the problem. Otherwise the program will say "mistake in data statements." Check to see if commas are missing, or if you have used periods instead of commas. Also check the individual data items.

Once the program has run, it is in memory ready to go. To activate the program type SYS49152 (SYS4864 on the 128), and press RETURN. You are now ready to enter the programs from the magazine. To disable the Entry Program, just type KILL [RETURN] on the 64 or SYS4867 on the 128.

The checksums for each line are the same for both the 64 and 128, so you can enter your 64 programs on the 128 if you'd like.

Typing the Programs

All the BASIC program listings in this magazine that are for the 64 or 128 have an apostrophe followed by four letters at the end of the line (e.g., 'ACDF). If you plan to use the Magazine Entry Program to enter your programs, the apostrophe and letters **should** be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it **does not** enter that line into memory. This makes it impossible to enter a line incorrectly.

Error Messages and What They Mean

There are five error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

NO CHECKSUM: This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

QUOTE: This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

KEYWORD: This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT..) incorrectly. Check the line in the magazine again and check your spelling.

OF CHARACTERS: This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

UNIDENTIFIED: This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word misspelled. Check the line in the magazine again and correct the mistake.

The Magazine Entry Programs are available on disk, along with other programs in this magazine, for $9.95. To order, contact Loadstar at 1-800-831-2694.

```
10 PRINT"[CLEAR]POKING -";
20 P=49152 :REM $C000  (END AT
   49900/$C2EC)
30 READ A$:IF A$="END"THEN 110
40 L=ASC(MID$(A$,2,1))
50 H=ASC(MID$(A$,1,1))
60 L=L-48:IF L>9 THEN L=L-7
70 H=H-48:IF H>9 THEN H=H-7
80 PRINT"[HOME,RIGHT12]"P;
90 IF H>15 OR L>15 THEN PRINT
   :PRINT"DATA ERROR IN LINE";
   1000+INT((P-49152)/8):STOP
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
   :GOTO 30
110 IF T<>86200 THEN PRINT
   :PRINT"MISTAKE IN DATA --> CHECK
   DATA STATEMENTS":END
120 PRINT"DONE":END
1000 DATA 4C,1F,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,0D,00,21
1002 DATA C1,27,C1,2F,C1,3F,C1,4C
1003 DATA C1,EA,EA,EA,4C,54,C0,A2
1004 DATA 05,BD,19,C0,95,73,CA,10
1005 DATA F8,60,60,A0,03,B9,00,02
1006 DATA D9,04,C1,D0,F5,88,10,F5
1007 DATA A0,05,B9,A2,E3,99,73,00
1008 DATA 88,10,F7,A9,00,8D,18,D4
1009 DATA 4C,EF,C0,E6,7A,D0,02,E6
1010 DATA 7B,4C,79,00,A5,9D,F0,F3
1011 DATA A5,7A,C9,FF,D0,ED,A5,7B
1012 DATA C9,01,D0,E7,20,2B,C0,AD
1013 DATA 00,02,20,74,C0,90,DC,A0
1014 DATA 00,4C,A9,C1,C9,30,30,06
1015 DATA C9,3A,10,02,38,60,18,60
1016 DATA C8,B1,7A,C9,20,D0,03,C8
1017 DATA D0,F7,B1,7A,60,18,C8,B1
1018 DATA 7A,F0,37,C9,22,F0,F5,6D
1019 DATA 03,C0,8D,03,C0,AD,04,C0
1020 DATA 69,00,8D,04,C0,4C,8E,C0
1021 DATA 18,6D,05,C0,8D,05,C0,90
1022 DATA 03,EE,06,C0,EE,09,C0,4C
1023 DATA CE,C1,18,6D,08,C0,8D,08
1024 DATA C0,90,03,EE,07,C0,EE,0A
1025 DATA C0,60,0A,A8,B9,0F,C0,85
1026 DATA FB,B9,10,C0,85,FC,A0,00
1027 DATA A9,12,20,D2,FF,B1,FB,F0
1028 DATA 06,20,D2,FF,C8,D0,F6,20
1029 DATA BC,C2,20,E4,FF,F0,FB,A0
1030 DATA 18,B9,08,C1,20,D2,FF,88
1031 DATA 10,F7,68,68,A9,00,8D,00
1032 DATA 02,4C,74,A4,4B,49,4C,4C
1033 DATA 91,91,0D,20,20,20,20,20
1034 DATA 20,20,20,20,20,20,20,20
1035 DATA 20,20,20,20,20,20,20,91
1036 DATA 0D,51,55,4F,54,45,00,4B
1037 DATA 45,59,57,4F,52,44,00,23
1038 DATA 20,4F,46,20,43,48,41,52
1039 DATA 41,43,54,45,52,53,00,55
1040 DATA 4E,49,44,45,4E,54,49,46
1041 DATA 49,45,44,00,4E,4F,20,43
1042 DATA 48,45,43,4B,53,55,4D,00
1043 DATA C8,B1,7A,D0,FB,84,FD,C0
1044 DATA 09,10,03,4C,84,C1,88,88
1045 DATA 88,88,88,B1,7A,C9,27,D0
1046 DATA 13,A9,00,91,7A,C8,A2,00
1047 DATA B1,7A,9D,3C,03,C8,E8,E0
1048 DATA 04,D0,F5,60,A9,04,4C,CA
1049 DATA C0,A0,00,B9,00,02,99,40
1050 DATA 03,F0,F0,C8,D0,F5,A0,00
1051 DATA B9,40,03,F0,E6,99,00,02
1052 DATA C8,D0,F5,20,96,C1,4C,12
1053 DATA C2,A0,09,A9,00,99,03,C0
1054 DATA 8D,3C,03,88,10,F7,A9,80
1055 DATA 85,02,A0,00,20,58,C1,20
1056 DATA 89,C1,20,ED,C1,E6,7A,E6
1057 DATA 7B,20,7C,A5,A0,00,20,80
1058 DATA C0,F0,D0,24,02,F0,06,4C
1059 DATA A8,C0,4C,CE,C1,C9,22,D0
1060 DATA 06,20,8D,C0,4C,CE,C1,20
1061 DATA BA,C0,4C,CE,C1,A0,00,B9
1062 DATA 00,02,20,74,C0,C8,90,0A
1063 DATA 18,6D,07,C0,8D,07,C0,4C
1064 DATA EF,C1,88,A2,00,B9,00,02
1065 DATA 9D,00,02,F0,04,E8,C8,D0
1066 DATA F4,60,18,AD,09,C0,69,41
1067 DATA 8D,09,C0,38,AD,0A,C0,E9
1068 DATA 19,90,06,8D,0A,C0,4C,1C
1069 DATA C2,AD,0A,C0,69,41,8D,0A
1070 DATA C0,AD,03,C0,6D,05,C0,48
1071 DATA AD,04,C0,6D,06,C0,8D,0C
1072 DATA C0,68,6D,08,C0,8D,0B,C0
1073 DATA AD,0C,C0,6D,07,C0,8D,0C
1074 DATA C0,38,E9,19,90,06,8D,0C
1075 DATA C0,4C,52,C2,AD,0C,C0,69
1076 DATA 41,8D,0C,C0,AD,0B,C0,E9
1077 DATA 19,90,06,8D,0B,C0,4C,67
1078 DATA C2,AD,0B,C0,69,41,8D,0B
1079 DATA C0,A0,01,AD,09,C0,CD,3C
1080 DATA 03,D0,20,C8,AD,0A,C0,CD
1081 DATA 3D,03,D0,17,C8,AD,0B,C0
1082 DATA CD,3E,03,D0,0E,AD,0C,C0
1083 DATA CD,3F,03,D0,06,20,CC,C2
1084 DATA 4C,4B,C0,98,48,68,4C,CA
1085 DATA C0,A9,20,8D,00,D4,8D,01
1086 DATA D4,A9,09,8D,05,D4,A9,0F
1087 DATA 8D,18,D4,60,20,A9,C2,A9
1088 DATA 81,20,DF,C2,A9,80,20,DF
1089 DATA C2,4C,D9,C2,20,A9,C2,A9
1090 DATA 11,20,DF,C2,A9,10,20,DF
1091 DATA C2,A9,00,8D,04,D4,60,8D
1092 DATA 04,D4,A2,70,A0,00,88,D0
1093 DATA FD,CA,D0,FA,60,END
```

END

```
5 TRAP 200
10 PRINT"[CLEAR]POKING -";
20 P=4864 :REM $1300  (END AT
   5545/$15A9)
30 READ A$:IF A$="END"THEN 110
80 PRINT"[HOME,RIGHT12]"P;
100 B=DEC(A$):POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>59382 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
200 PRINT:PRINT"DATA ERROR IN LINE";
    1000+INT((P-4864)/8):END
1000 DATA 4C,1E,13,4C,3A,13,00,00
1001 DATA 8E,00,F7,00,42,41,51,57
1002 DATA 0D,00,0D,43,08,14,0E,14
1003 DATA 16,14,26,14,33,14,A9,00
1004 DATA 8D,00,FF,AD,04,03,8D,12
1005 DATA 13,AD,05,03,8D,13,13,A2
1006 DATA 4A,A0,13,8E,04,03,8C,05
1007 DATA 03,60,AD,12,13,8D,04,03
1008 DATA AD,13,13,8D,05,03,60,6C
1009 DATA 12,13,A5,7F,D0,F9,AD,00
1010 DATA 02,20,5B,13,90,F1,A0,00
1011 DATA 4C,6F,14,C9,30,30,06,C9
1012 DATA 3A,10,02,38,60,18,60,C8
1013 DATA B1,3D,C9,20,D0,03,C8,D0
1014 DATA F7,B1,3D,60,18,C8,B1,3D
1015 DATA F0,35,C9,22,F0,F5,6D,06
1016 DATA 13,8D,06,13,AD,07,13,69
1017 DATA 00,8D,07,13,4C,75,13,18
1018 DATA 6D,08,13,8D,08,13,90,03
1019 DATA EE,09,13,EE,0C,13,60,18
1020 DATA 6D,0B,13,8D,0B,13,90,03
1021 DATA EE,0A,13,EE,0D,13,60,0A
1022 DATA A8,B9,14,13,85,FB,B9,15
1023 DATA 13,85,FC,A0,00,8C,00,FF
1024 DATA A9,12,20,D2,FF,B1,FB,F0
1025 DATA 06,20,D2,FF,C8,D0,F6,20
1026 DATA 79,15,20,A3,15,20,E4,FF
1027 DATA F0,FB,A0,1B,B9,EF,13,20
1028 DATA D2,FF,88,10,F7,68,68,A9
1029 DATA 00,8D,00,02,4C,B7,4D,91
1030 DATA 91,0D,20,20,20,20,20,20
1031 DATA 20,20,20,20,20,20,20,20
1032 DATA 20,20,20,20,20,20,91,0D
1033 DATA 51,55,4F,54,45,00,4B,45
1034 DATA 59,57,4F,52,44,00,23,20
1035 DATA 4F,46,20,43,48,41,52,41
1036 DATA 43,54,45,52,53,00,55,4E
1037 DATA 49,44,45,4E,54,49,46,49
1038 DATA 45,44,00,4E,4F,20,43,48
1039 DATA 45,43,4B,53,55,4D,00,C8
1040 DATA B1,3D,D0,FB,98,30,04,C9
1041 DATA 06,30,1E,88,88,88,88,88
1042 DATA B1,3D,C9,27,D0,13,A9,00
1043 DATA 91,3D,C8,A2,00,B1,3D,9D
1044 DATA 00,0B,C8,E8,E0,04,D0,F5
1045 DATA 60,4C,5C,15,4C,C5,14,A0
1046 DATA 09,A9,00,99,06,13,8D,00
1047 DATA 0B,88,10,F7,A9,80,85,FD
1048 DATA A0,00,20,3F,14,20,AE,14
1049 DATA 20,0D,43,84,FA,A0,FF,20
1050 DATA 67,13,F0,D8,24,FD,F0,06
1051 DATA 20,8F,13,4C,8F,14,C9,22
1052 DATA D0,06,20,74,13,4C,8F,14
1053 DATA 20,9F,13,4C,8F,14,A0,00
1054 DATA B9,00,02,20,5B,13,C8,90
1055 DATA 0A,18,6D,0A,13,8D,0A,13
1056 DATA 4C,B0,14,88,60,18,AD,0C
1057 DATA 13,69,41,8D,0C,13,38,AD
1058 DATA 0D,13,E9,19,90,06,8D,0D
1059 DATA 13,4C,CF,14,AD,0D,13,69
1060 DATA 41,8D,0D,13,AD,06,13,6D
1061 DATA 08,13,48,AD,07,13,6D,09
1062 DATA 13,8D,0F,13,68,6D,0B,13
1063 DATA 8D,0E,13,AD,0F,13,6D,0A
1064 DATA 13,8D,0F,13,38,E9,19,90
1065 DATA 06,8D,0F,13,4C,05,15,AD
1066 DATA 0F,13,69,41,8D,0F,13,AD
1067 DATA 0E,13,E9,19,90,06,8D,0E
1068 DATA 13,4C,1A,15,AD,0E,13,69
1069 DATA 41,8D,0E,13,A0,01,AD,0C
1070 DATA 13,CD,00,0B,D0,20,C8,AD
1071 DATA 0D,13,CD,01,0B,D0,17,C8
1072 DATA AD,0E,13,CD,02,0B,D0,0E
1073 DATA AD,0F,13,CD,03,0B,D0,06
1074 DATA 20,89,15,A4,FA,60,98,48
1075 DATA 68,4C,AF,13,A9,04,4C,AF
1076 DATA 13,A9,00,8D,00,FF,A9,20
1077 DATA 8D,00,D4,8D,01,D4,A9,09
1078 DATA 8D,05,D4,A9,0F,8D,18,D4
1079 DATA 60,20,61,15,A9,81,20,9C
1080 DATA 15,A9,80,20,9C,15,4C,96
1081 DATA 15,20,61,15,A9,11,20,9C
1082 DATA 15,A9,10,20,9C,15,A9,00
1083 DATA 8D,04,D4,60,8D,04,D4,A2
1084 DATA 70,A0,00,88,D0,FD,CA,D0
1085 DATA FA,60,END
```

END

Early Childhood Software

Continued from page 67

publishes an annual compendium of software reviews for children ages three to six. Their *1988 Survey of Early Childhood Software* reviews 286 programs of which 108 are Commodore 64/128 specific. The remaining 180 run on either Apple, Atari or IBM-compatible machines.

Searching the titles is a waltz; if it were any easier it would have training wheels. Software is listed by title, computer brand, publisher and content area (language, numbers, spatial relationships, time and logic). The 131-page book contains a glossary, index, evaluation explanations and 95 pages of concise reviews. Each package is rated on a 100-point scale for ease of use, educational value and instructional design. Black and white screen shots accompany some reviews, and all pertinent information about price, publisher and content is routinely included. No need to kiss all those frogs before you find your prince; read all about it first.

1988 Survey of Early Childhood Software
The High/Scope Press
600 North River Street, Ypsilanti, MI 48198
(313) 485-2000. $20.00

Software Directory

Continued from page 67

Every one was listed in the directory; each was described fairly and accurately. We suspect that if the educational software you seek exists, it's listed in *Bowker's Directory.*

The differences between High/Scopes' book and Bowker's is primarily in intended market. *The Survey of Early Childhood Software*, as its name implies, is limited to grades one through six; *Bowker's* extends to grade 12. Beyond that is depth. High/Scope reports on fewer packages but extensively evaluates each, Bowker lists considerably more, but includes descriptions as opposed to evaluations.

The *Survey* is an effective tool for teachers and parents to locate and identify software. Bowker's directory is more akin to a library reference manual—it is best used by administrators and curriculum planners. Note, these are only guidelines, they are not cast in stone. Since each delivers what their names promise, the answer may be to have both within reach.

Software for Schools 1987-88
R. R. Bowker
245 West 17th Street, New York, NY 10011
(212) 337-6934. $49.95

Continued from page 66

a word, copying, deleting and formatting a work disk. Users can save up to twenty puzzles on a work disk.

The package's teacher's manual contains practical suggestions for classroom applications as well as seven reproducible sample crosswords. These sample puzzles are in the manual only, not on the disk.

Reading the extensive instructions will be difficult for a young reader. A better technique is to have an older child or adult load the program and then explain the fundamentals of creating or playing a puzzle to the student. Afterwards, a child as young as seven can use the program on screen to fill in elementary crosswords. Even though *Crossword Magic* is not judgmental, beginning readers (3+) should deal with only printed crosswords.

In all respects this is a well-done professionally executed program. Its commands are intuitive and inclusive. Try as I might I was unable to lock it up or crash it. The program loads and responds to commands quickly, so toe tapping time is minimized.

While we emphasize *Crossword Magic*'s scholastic applications we foresee extensive outside uses. For instance, puzzles can be created for a contest or the school's newspaper, younger children can create unique party invitations and older students can drill in foreign languages.

Crossword Magic is a program that will do whatever users tell it to with a minimum of fuss and direction. As students create and solve crosswords, they are exercising their creativity, vocabulary, spelling and concentration skills and maybe not even realizing it.

Crossword Magic, $29.95

Computer:	Commodore 64
Ages:	Not specific
Publisher:	Mindscape, Inc. 3444 Dundee Rd., Northbrook, IL 60062 (800) 221-9884
Emphasis:	Vocabulary, spelling, association skills

Astro Grover

Drill and practice math programs that flash numbers on the screen are as exciting as a stop sign. Unless the authors shrewdly disguise the program's real intent, students will quickly become bored. But how much camouflage is enough? We'll deal with that question in a moment, first let's recap the program.

Grover of *Sesame Street* fame, looks like a furry blue "i" perched on spindly feet. As a result, he attracts some of his friends from the outer limits. In this case they're Zips from the planet Zap. Zips, it seems, were born to be counted, added and subtracted even when it means being irradiated by a ground- or space-based laser.

All five of *Astro Grover*'s games share a single backdrop of buildings silhouetted against an evening sky. A child's attention is unlikely to wander thanks to these eye-catching graphics combined with dynamic sound effects. Correct answers are rewarded by music, a spaceship rocketing into the ether (shaking the screen with its exhaust) or the construction of a colorful cityscape.

Even pre and early readers can participate. In all exercises only numbers less than ten are used. Although the elementary arithmetic principles are easily assimilated the younger child will need help initially with the function key-driven menu. The function of each key remains consistent throughout the five games.

The program loads a bit slowly. To its credit, once loaded it needs no more overlays from the disk. All of the exercises reside in memory allowing the student to rapidly switch between them.

I have mixed feelings about *Astro Grover.* First I'd like to see online help screens. Second, the graphics and sound are so lively they could possibly interfere with the student's concentration. Conversely, we concede that addition and subtraction drills are difficult topics, so they need these "Look here!" enhancements.

Another hiccup—software produced by the Children's Television Workshop (the mavericks who successfully redefined educational television with *Sesame Street* and *3-2-1 Contact*) rely on the function keys to the exclusion of the ENTER, space bar and cursor keys. Although they supply templates for the 64 and 128, this adds a layer of unfamiliarity and tends to divert time away from learning the content to understanding the program.

Even though their approach to education may be unique and controvertible, their programs are unquestionably entertaining and challenging. As evidenced in their out of the ordinary television series, CTW reflects a similar unique approach in educational software.

And it's this unique approach of cleverly masquerading as games that allows *Astro Grover* (and likewise Mindscape's *Crossword Magic*) to capture and caress a child's curiosity.

Astro Grover, $9.95

Computer:	Commodore 64
Ages:	3–7 years
Publisher:	Hi Tech Expressions 584 Broadway, New York, NY 10021 (212) 941-1224
Emphasis:	Addition, subtraction and counting

Computer Learning Month: Dr. Brumbaugh

Continued from page 68

should have the opportunity to be educated with computers. Why? Because it's essential that they understand what computers can and cannot do for them. Additionally, both students and adults should know how to use computers when appropriate to solve problems or improve communicating with one another.

What I'm saying is that it's important for individuals, all individuals, to make effective use of computers in their daily lives. For students, more can be learned; they have the benefit of receiving intensified instruction in specific areas. For those past their formal school years, I think it appropriate that everyone who has expressed an interest be given the opportunity to become computer literate.

Millman: I too am less than thrilled about the term. Like "user friendly" it's been beaten to death a dozen times over, but it gets the idea across fast. We'll use it just once more: What are the future rewards for students or adults who expend the effort to become computer literate?

Brumbaugh: They'll have access to better, higher-paying jobs. They'll make more effective use of their professional and personal time, which includes being able to participate in some fascinating types of electronic entertainment.

Millman: Ken, we've discussed the future both near and distant, so our final question deals with the present. What's the status of computers in education now?

Brumbaugh: Schools are doing a good job of exposing students to educational computing, but more needs to be done. Today's students live in a world replete with video and sound, so new instructional models are needed that reflect their environment. With today's computers, like the Amiga, much more can be accomplished by combining meaningful graphics with extended audio.

Now that video and text can be combined with numerical data and readily merged into programs and files, I believe instructional models will be designed to develop this readily available lower-cost technology.

Additionally, by way of innovative instruction using computers, students will be able to calculate, analyze, explain, interpret data, as well as practice specific skills. We can, must and should move forward.

Commodore has the answers in its wide and inclusive product line. With Commodore re-emphasizing the educational use of computers we all have something to gain, most of all educators and students. It's an ideal decision, a win/win solution.

Past and Present Priorities

For more than twenty years Ken has remained in the forefront championing the educational applications of computers. Reflecting on technology's advances he notes, "Many things have changed in two decades . . . I've learned what educators are looking for, what they need, what they expect from producers. I can prioritize, correlate the needs of the users with the products of the producers."

Ken's bringing his talent, plans and marketing savvy to bear to aid Commodore in achieving their goal in the competitive educational market. Throughout our conversation he projected an image of a skipper deftly guiding his ship through the shoals.

***Editor's Note:* Since this interview, Ken has been hired as Commodore's Director of Educational Marketing.**

Tips & Tricks/64 and 128

Continued from page 16

```
71 DATA 000,000,000,024,000,000,126,
   000
72 DATA 000,255,000,001,255,128,003,
   255
73 DATA 192,015,255,240,031,129,248,
   060
74 DATA 000,060,056,000,028,048,000,
   012
75 DATA 008,000,016,004,000,032,002,
   000
76 DATA 064,001,000,128,000,129,000,
   255
100 PRINT CHR$(14):POKE 53280,6
    :POKE 53281,6
110 PRINT"[HOME,DOWN22]";TAB(10);"
    [GRAY3,CMDR P20]"
120 PRINT TAB(10);"[RVS,CMDR A,SHFT *,
    CMDR S] [SHFT P]ARATROOPER!
    [CMDR A,SHFT *,CMDR S]"
130 PRINT TAB(10)"[RVS,CMDR Z,SHFT *,
    CMDR E,SHFT *14,CMDR E,SHFT *,
    CMDR X,RVOFF,HOME]"
140 POKE 53248,160:POKE 53250,160
    :POKE 53277,3:POKE 53287,7
    :POKE 53288,1
150 SL=15680:FOR J=SL TO SL+126:READ K
    :POKE J,K:NEXT: REM SPRITES INTO
    MEMORY
160 POKE 53269,3
170 POKE 2040,245:POKE 2041,246
    : REM SPRITE POINTERS
180 FOR Y=0 TO 191:POKE 53251,Y
    :POKE 53249,Y+20:NEXT
190 FOR J=1 TO 600:NEXT
200 POKE 2040,11:POKE 2041,11
    : REM SPRITE POINTERS
210 FOR Y=191 TO 250:POKE 53251,Y
    :POKE 53249,Y:NEXT
220 GOTO 170
```

64 sprites on the 128: It's easy to convert sprite programs for the 64 to work in 128 mode, if you know a few secrets. Here they are:

1. 64 sprites can be located anywhere in memory, while 128 sprites have a special area reserved for them at 3584-4095. Since you'll seldom find a 64 program that locates them in 3584-4095, your converted program will have to put them there itself.
2. The 64 sprite locations often contain all zeroes at power up, while the 128 sprite locations never do. On the 128, then, your program should zero these locations out before POKEing the sprites.
3. In both computers, the "sprite pointers," locations 2040-2047, tell the computer where the sprites are located in memory. The values in the pointers must equal the address of the first byte of the corresponding sprite, divided by 64.
4. In the 128, POKEs to the sprite location registers won't work unless you first POKE 4861 with a non-zero value. This all-important POKE disables the MOVSPR command, which otherwise controls the positions of the sprites. It's a good practice to POKE 53264,0 at the same time; this puts all the sprites onto the left side of the screen, where most 64 programs assume them to be at power up. If you fail to make this POKE, it's possible that MOVSPR has put them on the right where you don't want them.

The POKE to 4861 also disables the PLAY statement and some other features of BASIC 7.0, so you shouldn't add BASIC 7.0 statements to your converted program. You can reenable MOVSPR and the rest of BASIC 7.0 by simultaneously pressing STOP and RESTORE, or by executing POKE 4861,0.

5. Your program can detect whether it's running in 64 mode or 128 mode by PEEKing location 65534. If the result is 23, the system is in 128 mode.

I use the following lines of code to let my sprites work in either mode. They assume that the sprites are put into 64 memory starting at location 832; if your program puts them somewhere else, substitute that location for 832 in line 10:

```
10 SL=832:IF PEEK(65534)=23 THEN SL=3584:POKE
   4861,1:POKE 53264,0
20 FOR J=0 TO 511:POKE SL+J,0:NEXT
30 FOR J=0 TO 7:POKE 2040+J,J+SL/64:NEXT
40 This line should POKE your sprites into memory at SL
   upward.
```

Once these lines are in the program, I look through the rest of it for POKEs to 2040-2047, changing them as required by the new situation. To reset the 128 to normal operation when the program is finished, I include something like this at the end:

```
50000 IF PEEK(65534)=23 THEN POKE 4861,0
50010 END
```

Now that you know the secrets, you should practice them by converting a program or two. The Paratrooper program above is an interesting one to start with.
Louis F. Sander
Pittsburgh, PA

Doodle Printouts: You've probably noticed that this popular program doesn't print images on the printer in the same proportions as it displays them on the screen. You can often make a better printed image by rotating it a quarter turn or expanding it once vertically before printing it. This counters the effect normally produced—a printout that is compressed vertically.
Jimmy Bednar
Houston, TX

***Print Shop* and LOGO:** You can use LOGO to create pictures for use with *Print Shop*. After creating your LOGO picture on the screen, type SAVEPICT"filename". This saves the picture as a 33-block hi-res file named "filename.PIC1" and a 5-block color file named "filename.PIC2". The first one will load into Screen Magic when you select the Get Screen option. After loading it, you can alter it, add text, and load and save the altered picture at will.
Barrett Stridiron
Charlotte Amalie, Virgin Islands

GEOS and *Print Shop* or *Printmaster*: While GEOS can be used to make very nice signs, notebook covers, and so forth, it lacks the capability of making borders. *Print Shop* and *Printmaster*, of course, can create a wonderful selection of borders.

To create a GEOS document with a border, first use *Print Shop* or *Printmaster* to print a border on a sheet of paper. Then roll the paper back into your printer and use GEOS to print the text.
Peter Lin
Irvine, CA

Convenient Word Processor Formatting: Sometimes when you are going to be using the same text formatting commands on several different documents, it's easier to make a file out of them. Then whenever you want a document using that format, you can load the file and append your document text after the formatting directives.
Matthew Ettus
Rego Park, NY

Disabling Modem Autoanswer: Autoanswer modems like Commodore's 1670 will answer incoming calls whenever the computer is on, whether it's telecommunicating or not. Most human callers get very disoriented when a computer answers their calls.

Some computerists avoid the problem by connecting their modems only when actually telecommunicating or by using software to disable the autoanswering feature every time they power up or reset. Forgetfulness easily defeats either of these techniques, and neither is compatible with hassle-free computing.

At $7.95, Radio Shack's 43-127 Ringer Silencer is the perfect solution to the problem—it prevents the ringing signal from reaching the modem, but doesn't disturb anything else.

I keep my 1670 permanently plugged into my 128 and permanently connected, through the switched off Ringer Silencer, to a telephone jack on the wall. Since the modem is always plugged into the line, I can telecommunicate at any time without making additional connections. Since the computer never answers the phone, my human callers retain their pleasant dispositions.
Lucy S. Terrier
Alton, IL

Tips on Running a BBS: If you think you can run a Bulletin Board System with one computer, little storage and a temporary BBS program, you're likely to find things becoming a lot more "permanent" than expected. When thinking about your own BBS, you should heed the following advice:

1. Get *all* the necessary hardware first. It's a good idea to go with lots of disk storage; at least one megabyte is recommended. Many Sysops I know use SDF1001 drives, which give one megabyte of storage on a single 5.25-inch floppy. Hard drives, though expensive, will assure you plenty of storage. A 1200 baud modem is almost an essential, as is a dedicated telephone line with a phone whose ringer can be shut off.

A second computer is good to have, too, in case you get the urge to play *California Games* when your 64 is running the bulletin board.

2. Pick the right software. The right software package is one that is advanced enough to make its use easy, with plenty of features for the expert user. The popular BBS's in my area seem to like a package called C-Net. It uses lots of memory, but it has the features you need.

3. Keep the BBS operational during its prescribed hours. When you advertise your BBS, always include its hours. It is not good for your reputation if callers get angry voices at 3:00 AM when they expected to get your BBS.
Sean Machado Leadhead
Address Unknown

Labels and Printer Safety: Those self-adhesive pressure sensitive labels are marvelous for addressing letters, but disastrous if

they become stuck to the inside your printer. You can prevent disaster by paying careful attention to the labels before you feed them through.

You can make sure sticky corners aren't sticking up by laying the label stock face-down on a table and smoothing it out from the back. If the backing paper is torn or bent, throw that section away and use some other labels.

Finally, *never* try to back labels out of your printer. To remove a string of labels, cut the string before it enters the back of the printer, then feed the unused labels forward. Believe me, it's *much* better to waste a few labels than to get one stuck in your printer.

Kevin Healey
Lansdale, PA

*[**Editor's Note:** If, (heaven forbid!) a label does jam and the adhesive sticking to your platen is gumming up the works, use a little rubbing alcohol on a paper towel to wipe it clean.]*

Star SG-10 Hex Mode: This and some other printers have a useful hex mode, in which everything the printer receives is printed out as hex digits; the effect is sort of like a machine language monitor.

Hex mode is very useful in debugging bad print routines, since it allows you to see exactly what the printer is receiving, control codes and all.

To activate hex mode on the SG-10, first turn the printer off. Then hold down the FF and LF buttons while reapplying power; keep them depressed until the beeper sounds. The printer is now in hex mode until it is initialized or turned off.

Barrett Stridiron
Charlotte Amalie, Virgin Islands

Heartbreaks and Backups: I've been working with Commodore computers since 1979, during which time I've owned eight different Commodore models. Over that period, I've written or edited several thousand tips like the one you're reading right now. Most people would say I know what I'm doing.

Last weekend I was reviewing, organizing and upgrading the 107 programs that have appeared in this column to date, with an eye toward collecting them all in a book. As I finished with each program, I saved it onto a disk I was using to collect everything in one place. Being an experienced and cautious computerist, every half hour or so I made a backup copy of that disk. Being interested in speed and efficiency, I kept both the master and the backup in front of me on my desk, each carefully identified on its label.

Since I'd been working on this project all day, both my main disks were very full of programs. As part of my work, I was also using several other disks, each of which I would reformat from time to time.

Imagine my surprise when, in a momentary lapse of concentration, I reformatted my master disk!

"Well," I thought, "no harm done, since I've wisely made a backup." Imagine my further surprise when I discovered that, in a previous lapse of concentration, I had also reformatted my backup!

There I sat, experienced, knowledgeable and cautious, just having erased every bit of work I'd done since getting up that morning. Eight hours of meticulous program development, done on almost a hundred different programs, absolutely wiped out!

Instead of crying (which I felt for a while like doing), or cursing (which I was very tempted to try), I started to reconstruct my work. It went somewhat easier the second time through, but it still took over six hours.

Like most computer tragedies, mine would have been avoided if I'd used just a little more caution. I did the right thing in making a backup, but I stopped a little too soon. Every time I made that backup, I should have taken it far from my computer, where foolish hands couldn't easily get to it. In fact, I keep a disk storage box in the top of my linen closet, exactly for this purpose. That box holds the original of every commercial disk I own, plus the originals of all my best creations. I keep it far from my computer so I won't be victimized by momentary lapses of attention.

Last weekend, in fact, that box held all but one of the important backups in my life. And you see what happened to that one!

The moral of the story is simple and very important. You should repeat it aloud at least twice:

1. MAKE A BACKUP OF EVERY IMPORTANT DISK YOU OWN.
2. KEEP YOUR BACKUPS IN A SAFE PLACE OUTSIDE YOUR COMPUTER ROOM.
3. WHENEVER YOU RUIN A DISK, REVIEW STEPS 1 AND 2.

Louis F. Sander
Pittsburgh, PA

64 Line Number Suppression: If you want to avoid the line numbers in a listing, just POKE 22,35. With POKE 22,25 the line numbers will be shown again.

Christian A. Wentzensen
Asuncion, Paraguay

INTeresting Bug: If you type PRINT 8.4*100/2 then press RETURN, the result will appear as 420. But if you try PRINT INT(8.4*100/2) the result will be 419!

Since the computer does all its math in base two, decimal input and output involve several conversions between bases. Since many such conversions involve rounding up or down, the final answer is sometimes not what you thought it would be.

In the case illustrated here, the result inside the parentheses may have come out to 419.99999999 +, due to rounding during base conversions. Without the INT, the computer further rounded it off to 420.

With the INT, of course, everything after the decimal point is dropped, leaving you with 419.

Joe Bian
Brookline, MA

Write-protect Detector: This will detect if there's a write-protect tab on the disk in drive 8. Although it's written as a program, you'd normally use it as a subroutine.

Joseph R. Charnetski
Plains, PA

```
2000 REM WRITE-PROTECT DETECTOR -
     JOSEPH R. CHARNETSKI
2010 OPEN 1,8,15:PRINT#1,"M-R";
```

```
     CHR$(30);CHR$(0):GET#1,A$:CLOSE 1
2020 IF ASC(A$+CHR$(1))=1 THEN PRINT
     "DISK IS WRITE-PROTECTED"
     :GOTO 2040
2030 PRINT"DISK IS NOT WRITE
     PROTECTED"
2040 END : REM RETURN
```

Editing SEQ Files: Programmers often store data in sequential files which are later read by their programs. Unfortunately, if a SEQ file becomes corrupted, finding and correcting the problem can be a major headache.

Compounding the difficulty is that many errors are created by bugs in the program you are writing. So you need to analyze the SEQ file so you can analyze the mistakes in your program!

One of the easiest ways to look at your SEQ files and to make corrections is to use your word processor. Most will allow you to load a sequential file, letting you examine the items one at a time until you discover the error.

Charles W. Lewis, Jr.
Fitzgerald, GA

128 End Writer: This short routine adds a visually interesting ending to any 128 program by creating over-sized characters on a 40-column hi-res screen. It prints the words *The End* on an upward slope in the center of the screen. Just like Hollywood.

Joseph R. Charnetski
Plains, PA

```
60000 REM 128 END WRITER -
      J.CHARNETSKI
60010 X=104:Y=112:GRAPHIC 2,1,16
      :CHAR,0,24,"THE END"
60020 FOR J=1 TO 56:SSHAPE E$,J+2,191,
      J,199:GSHAPE E$,X+J*2,Y-J:NEXT
60030 END
```

Plus/4 Resources: Readers who own the Plus/4 or who have friends who do, should be aware of the world's best resource group for the Plus/4. It's PLUG, the Plus/4 User's Group, Box 1001, Monterey, CA 93942. Membership is $20 per year in the U.S., Canada and Mexico, $25 per year elsewhere. PLUG's newsletter is published at least eight times per year, and is chock-full of information about sources of programs and accessories for the Plus/4.

There are over 1000 PLUG members right now, at all levels of computer knowledge.

Members may also use the PLUG disk library for a minimal copying and postage charge. We have about 20 disks full of various programs for the PLUS/4. One recently-released disk contained a morse code training program from a member in Germany, a conversion of the 64's animated Max Headroom graphic, a program that lists and sorts all the amendments to the U.S. Constitution, some information about PEEKs, POKEs and screen codes, and almost two dozen other items.

Calvin Demmon
Monterey, CA

(Calvin Demmon is editor of the newsletter and contact person for the group. You can reach him by mail at the above address, or on CompuServe at 73537,404. If you use the mail and request a response, please enclose a self-addressed stamped envelope. LFS)

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DUNGEON MASTERS ASSISTANT, Volume I: Encounters is a utility program designed to help Dungeon Masters generate encounters for AD&D® campaigns. It provides more than 1000 encounters, and over 1300 monsters and characters, including all of the monsters found in AD&D® *Monster Manuals I & II*. DMs can modify the existing data and add original monsters and encounters to the database.



IBM
APPLE
C-64/128



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